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TREES, SHRUBS AND VINES

OF THE

NORTHEASTERN UNITED STATES

THEIR CHARACTERISTIC LANDSCAPE FEATURES

FULLY DESCRIBED FOR IDENTIFICATION BY THE NON-BOTANICAL READER; TOGETHER WITH AN ACCOUNT OF THE PRINCIPAL FOREIGN HARDY TREES, SHRUBS AND VINES CULTIVATED IN OUR COUNTRY, AND FOUND IN CENTRAL PARK, NEW YORK CITY

BY

H. E. PARKHURST

"The gods, to live in woods, have left the skies."
Dryden

ILLUSTRATED

CHARLES SCRIBNER'S SONS
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To

MY WIFE

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TREES, SHRUBS AND VINES

OF THE

NORTHEASTERN UNITED STATES

OPENING LEAVES

"Thou, nature, art my goddess: to thy law
My services are bound: wherefore should I
Stand to the plague of custom?"

—SHAKESPEARE.

OUR field of observation in the following pages is practically the entire Northeastern States. The record is in no sense local, except as the chosen background of the pictorial account is the most representative and extensive collection of our finest native and foreign growth, arranged for landscape effect, that is to be found in the country—the famous Central Park, of New York City.

This small and definite area not only affords a splendid concrete example of landscape vegetation for the thousands annually traversing it, but is so illustrative of every phase of hardy, deciduous, and evergreen growth at home and abroad as to afford ample opportunity for discussing the entire range of native vegetation in tree, shrub, and vine, from Maine to North Carolina, and west to the Mississippi, and the abundant decorative species from Europe and Asia, that are now figuring so conspicuously in all our private lawns and gardens.

This is the first time that a description of all the trees, shrubs, and vines in Central Park has been presented to the public. The nearest approach to it was a botanical

list, published in 1875 by the Park Commissioners, in their third general report, upon the completion of the Park; a list now valueless, owing to the subsequent disappearance of many species not suitable to our climate, and the addition, in recent years, of many choice foreign plants.

The utility of the following account, in its relation to the Park, is not limited to even the large numbers that frequent these splendid grounds; for the ornamental growth here is of so representative a character as to comprise most of the species cultivated anywhere in the Northeastern States, the identification of which is made possible in these pages without resorting to text-books. It may also be added that, for a considerable amount of the foreign growth herein described, which is becoming widely popular for lawns and parks, no description, sufficiently detailed for identification, is elsewhere to be found in any American publication, nor can all of it be found in any single foreign work. In recent years the treasures of Japan and other parts of Asia, as well as of Europe, have been extensively drawn upon for landscape decoration, and the following pages afford a ready reference for determining the leading species in the three distinctive types of growth herein considered.

At the same time it is a matter for pride that our own sylva is worthy of so large a representation in this notable collection; and those unfamiliar with our native species may be surprised to find that some of the most stately and picturesque effects in forestry, and some of the most brilliant and graceful forms of shrub and vine,

are the result of indigenous growth. Other climes have given us the yulan, tamarix, forsythia, quince, English hawthorn, bird cherry, ailanthus, the most valuable conifers, the deutzia, hydrangea, lilac, many beautiful spiræas, azaleas, weigelas, etc., etc.; but we are proud of our elms, maples, and oaks, our flowering dogwood, silver-bell-tree, red-bud, cottonwood, buttonwood, yellow-wood, catalpa, beech, birch, etc. At the same time it is useless to deny that in very many genera the foreign species decidedly outrank the native; and in the last analysis will it not be necessary to admit that, with a presumably Asiatic origin of species, we are ultimately indebted to the Eastern hemisphere for all our wealth of vegetation?

The catalogue herein presented is based upon accurate official lists recently completed, and not yet published, by the Park Department, the correctness of which has been largely verified by my own observations during the past two years.

This extensive area of landscape gardening is in three sections: the first, extending from Fifty-ninth Street to the north side of the "Ramble," is by far the most favorable for study, as it contains, in an area of little more than half a square mile, the majority of all the species throughout the grounds. The second section, reaching northward from the "Ramble" to above Ninetieth Street, though hardly less beautiful in scenery, is not so elaborately cultivated; and the third section contains the wilder portion at the upper end, where nature boldly asserts itself amid the few deft touches of art.

Trees, Shrubs and Vines

The following is a complete list of the trees, shrubs, and vines in the Park. Those with an asterisk are foreign or American extra-limital, the others are native or naturalized in the Northeastern United States.

DECIDUOUS TREES (not cone-bearing)

Ailanthus (A. glandulosa)
Alder (Alnus)
*(glutinosa)
*(cordata)
Angelica-tree (Aralia spinosa)
Ash (Fraxinus)
White (americana)
*Flowering (ornus)
*European (excelsior)
Black (sambucifolia)

Beech (Fagus)
American (ferruginea)
*European (sylvatica)
*Weeping (sylvatica pendula)
*Purple (sylvatica atropurpurea)
*Cut-leaved (sylvatica asplenifolia)
Birch (Betula)
White (populifolia)
Black (lenta; nigra)
Red (rubra)
Yellow (lutea)
Paper (papyracea)
*Cut-leaved (laciniata)
*Weeping (pendula)
*Purple-leaved (alba, var. atropurpurea)

Buckeye (Pavia)
Yellow (flava)
Ohio (ohioensis)
*Red (rubra)
Buckthorn, Common (Rhamnus catharticus)
Butternut (Juglans cinerea)
Buttonwood (Platanus)
(occidentalis)
*(orientalis)

Catalpa (Catalpa)
(bignonioides)
*(bungei)
Cherry (Plum), (Prunus)
Wild Black (serotina)
Wild Red (pennsylvanica)
Sloe, Black Thorn (spinosa)
*Garden Red (cerasus)
*Small Bird Cherry (padus)
*Japanese Plum (pissardii)
*(mahaleb)
Chestnut (Castanea)
American (americana)
*European (sativa)
*Cork-tree (Phellodendron armorense)

Dogwood (Cornus)
Flowering (florida, var. alba)

DECIDUOUS TREES—*Continued*

Dogwood—*Continued*
- Flowering (florida, var. rosea)
- Alternate-leaved (alternifolia)

Elm (Ulmus)
- White (americana)
- Slippery (fulva)
- *English (campestris)
- *Wych or Scotch (montana)
- *Small-leaved (parvifolia)
- *Long-stemmed Mountain (effusa)

*Ginkgo-tree (Salisburia adiantifolia)

Hickory (Carya)
- Shagbark (alba)
- Western Shell-bark (sulcata)
- Mocker-nut (tomentosa)
- Pig-nut (porcina)

Holly (Ilex)
- American (opaca)
- *European (aquifolium)
- *Large-leaved (macrophyllum)

Hop-hornbeam (Ostrya virginica)

Hop-tree (Ptelea trifoliata)

Hornbeam (Carpinus)
- *European (betulus)
- American (americana)

Horse-chestnut (Æsculus hippocastanum)

June-berry (Amelanchier canadensis)

Kentucky Coffee-tree (Gymnocladon canadensis)

*Kœlreuteria paniculata

*Laburnum, Common (L. vulgare)

Linden (Tilia)
- American (americana)
- *European (europæa)

Locust, Common (Robinia pseudacacia)
- Common (Robinia pseudacacia, var. inermis)
- Honey (Gleditschia triacanthus)
- *Chinese (Gleditschia sinensis)

Magnolia (Magnolia)
- Cucumber (acuminata)
- Umbrella (tripetala)
- Great-leaved (macrophylla)
- Small or Laurel (glauca)
- *Yulan (conspicua)
- *Purple (purpurea)
- *(soulangeana)

Maple (Acer)
- Red (rubrum)
- Silver-leaf (dasycarpum)
- Sugar (saccharinum)

DECIDUOUS TREES—*Continued*

Maple—*Continued*
- Sugar cut-leaved (s. dissectum)
- Ash-leaved (negundo)
- *Field (campestre)
- *Sycamore (pseudo-platanus)
- *Purple-leaved (pseudo-platanus, var. atropurpureum)
- *Norway (platanoides)
- *Tartarian (tartaricum)
- *(palmatum)
- *(polymorphum)
- *(polymorphum dissectum atropurpureum)

*Mulberry, Paper (Broussonettia papyrifera)
- *White (Morus alba)
- *Black (Morus nigra)
- Red (Morus rubra)

Nettle-tree (Celtis occidentalis)

Oak (Quercus)
- White (alba)
- Swamp White (bicolor)
- Scarlet (coccinea)
- Red (rubra)
- Post (obtusiloba)
- Laurel or Shingle (imbricaria)
- Bur-oak (macrocarpa)
- Willow (phellos)
- Chestnut (prinus)
- Black (nigra)

Oak—*Continued*
- Pin (palustris)
- *European (robur)
- *European Weeping (r. pendula)
- *European Cut-leaved (r. asplenifolia)
- *(lyrata)
- *(cerris)

*Oleaster (Elæagnus angustifolia)

*Orange (Citrus trifoliata)

*Osage Orange (Maclura aurantica)

*Paulownia imperialis

Pear, Apple (Pyrus)
- *(malus)
- *(floribunda)
- *(spectabilis)
- *(toringo)

Persimmon (Diospyros virginiana)

Poplar (Populus)
- *White (alba)
- Cottonwood (monilifera)
- Balsam (balsamifera)
- Aspen (tremuloides)
- *Lombardy (dilatata)

Red-bud (Cercis)
- (canadensis)
- *(japonica)

*Sand-thorn, Common (Hippophæ rhamnoides)

DECIDUOUS TREES—*Continued*

Sassafras (S. officinalis)
*Sophora (S. japonica)
Silver-bell-tree (Halesia tetraptera)
Sorrel-tree (Oxydendron arboreum)
Sweet Gum (Liquidamber styraciflua)

Thorn (Cratægus)
- Cock-spur (crus-galli)
- Scarlet (coccinea)
- Summer Haw (flava)
- Black (tomentosa)
- *English Hawthorn (oxyacantha)
- *English Hawthorn (oxyacantha flore plena rosea)

Tulip-tree (Liriodendron tulipifera)
Tupelo (Nyssa multiflora)

Viburnum (Viburnum)
- Black Haw (V. prunifolium)
- Sheep-berry (V. lentago)

*Walnut, English (Juglans regia)
Willow (Salix)
- Glaucous (discolor)
- *Weeping (babylonica)
- *(pentandra)
- *(alba vitellina)
- *(lancifolia)
- *(rosmarinifolia)

Yellow-wood (Cladrastis tinctoria)

EVERGREEN AND CONIFEROUS TREES

Arbor-vitæ (Thuja)
- Common (occidentalis)
- *Giant (gigantea)

Bald Cypress (Taxodium distichum)

Cedar (Cedrus)
- *of Lebanon (libani)
- *Himalaya (atlantica)

*Cephalotaxus fortunei
*Cryptomeria japonica

Fir (Picea)
- Balsam (balsamea)
- Fraser's (Fraseri)

Hemlock (Tsuga)
- Hemlock Spruce (canadensis)
- *Douglas' (douglasii)

Juniper (Juniperus)
- Common (communis)
- Prostrate (prostrata)
- *Sabine's (sabina)
- *(squamata)

Larch (Larix)
- American (americana)
- *European (europæa)
- *False (Pseudo-larix)

EVERGREEN AND CONIFEROUS TREES—*Continued*

Pine (Pinus)
- White (strobus)
- Yellow (mitis)
- Pitch (rigida)
- Loblolly (tæda)
- Jersey Scrub (inops)
- *Himalaya (excelsa)
- *Cembra (cembra)
- *Scotch (sylvestris)
- *Austrian (austriacus)
- *(Mugho)

Red Cedar (Juniperus virginiana)

*Retinospora pisifera
- *ericoides
- *obtusa
- *obtusa aurea

Spruce (Abies)
- *Norway (excelsa)
- *Eastern (orientalis)
- *Silver Fir of Colorado (concolor)
- *Nordmann's Silver Fir (nordmanniana)
- *Colorado Blue Spruce (pungens)

White Cedar (Cupressus thujoides)

Yew (Taxus)
- *English (baccata)
- *(cuspidata)

SHRUBS

Alder, Green (Alnus viridis)

Andromeda floribunda

*Aralia chinensis
- *pentaphylla

*Aucuba japonica

Azalea (Rhododendron)
- Purple (nudiflorum)
- Flame-colored (calendulaceum)
- Clammy (viscosum)
- *(amœnum)
- *(molle)
- *(ponticum)

Baccharis halinsifolia

Barberry (Berberis)

Barberry—*Continued*
- *Common (vulgare)
- *Purple-leaved (v. purpurea)
- *Holly-leaved (Mahonia aquifolium)
- *(Thunbergii)
- *(Fortunei)

Bay-berry (Myrica cerifera)

Bladder-nut (Staphylea)
- (trifoliata)
- *(pinnata)
- *(colchica)

*Bladder-senna (Colutea arborescens)

Blueberry (Vaccinium)

SHRUBS—*Continued*

Blueberry—*Continued*
Common Swamp (corymbosum)
Low (vacillans)
Blue Dangle (Gaylussacia frondosa)
*Box, Tree (Buxus sempervirens)
Buckthorn (Rhamnus)
*(frangula)
*(alaternus)
Button-bush (Cephalanthus occidentalis)

*Cercidophyllum japonicum
Cherry, Plum (Prunus)
Choke (virginiana)
Beach Plum (maritima)
*(sinensis)
Choke-cherry (Pyrus)
red-berried (arbutifolia erythrocarpa)
black-berried (arbutifolia melanocarpa)
Coral-berry (Symphoricarpus racemosa)
*Cotoneaster vulgaris
*frigida
*Currant, Missouri (Ribes aureum)

*Deutzia gracilis
*crenata
*scabra
Dogwood (Cornus)
Wild Red-osier (stolonifera)
Dogwood—*Continued*
Stiff (stricta)
Silky (sericea)
*European Red-osier (sanguinea)
*Cornelian Cherry (mas)

Elder (Sambucus)
Common (canadensis)
Red-berried (racemosa)
*Black (nigra)
*(nigra, var. aurea)
Euonymus americana
*japonica
*Exochorda grandiflora

*Flowering Almond (Amygdalus communis flore pleno)
False Indigo (Amorpha fruticosa)
*Fontanesia fortunei
*Forsythia viridissima
*suspensa
*fortunei
Fringe-tree (Chionanthus virginica)

Hazel-nut (Corylus)
*avellana
*avellana, var. atropurpurea
*Heath (Erica carnea)
Heather (Calluna vulgaris)
Honeysuckle (Lonicera)
*(fragrantissima)
*(Morrowi)

SHRUBS—*Continued*

Honeysuckle—*Continued*
*(rubra)
*(tartarica)
*Horse-chestnut, Dwarf (Æsculus macrostachya)
Hydrangea arborescens
*hortensis
*paniculata grandiflora
*quercifolia
*nivea

*Jasmine, Early-flowering (Jasminum nudiflorum)

*Kerria japonica
*Kerria japonica flore pleno
*Kerria japonica fol. var.

Laurel, Mountain (Kalmia latifolia)
Leucothoë catesbæi
Lilac (Syringa)
*Josikæa
*villosa
*vulgaris alba
*vulgaris rubra
*persica alba
*persica rubra
*Lycium barbarum
*chinensis

*Magnolia stellata

Oleaster (Elæagnus)
*argentea
*longipes

*Pea-tree, Siberian (Caragana arborescens)
Philadelphus, Syringa (Philadelphus)
(inodorus)
(grandiflorus)
*(coronarius)
*(gordonianus)
*(nana aurea)
Privet (Ligustrum)
*(ovalifolium)
*vulgare
*ibota
*italicum

Quince (Cydonia or Pyrus)
*(Common)
*(Japanese)

Raspberry (Rubus)
Purple-flowering (odoratus)
*(idæus)
*(fruticosa)
*(fruticosa, var. laciniata)
Rhododendron (R.)
*(ponticum)
*(hybridum)
*Rhodotypus kerrinoides
Rose (Rosa)
Early Wild (blanda)
Sweet Brier (rubiginosa)
*(Boursaltii)
*(canina)
*(rugosa)
*(centifolia)

SHRUBS—*Continued*

Rose-acacia (Robinia hispida)
*Rose-mallow (Hibiscus californicus)

*Shepherdia argentea
Shrub, Sweet-scented (Calycanthus)
(floridus)
(lævigatus)
*Shrubby Althæa (Hibiscus syriacus)
Spice-bush (Lindera benzoin)
Spiræa (S.)
Nine-bark (opulifolia)
Nine-bark (opulifolia, var. aurea)
Hardhack (tomentosa)
*(callosa alba)
*(callosa rosea)
*(Antonia Wateri)
*(Douglasii)
*(Reevesii)
*(Reevesii flore pleno)
*(sorbifolia)
*(Van Houttii)
*(salicifolia)
*(Fortunei)
*(Thunbergii)
*(trilobata)
*(prunifolia)
*St. John's-wort (Hypericum moseriana)
Storax (Styrax)
*(japonica)
Stuartia pentagyna
Sumach (Rhus)
Sumach—*Continued*
smooth (glabra)
cut-leaved (glabra, var. laciniata)
staghorn (typhina)
dwarf (copallina)
*Smoke-tree (cotinus)
Snow-berry (Symphorocarpus racemosa)

*Tamarix gallica
*africana
*indica
Thorn, Evergreen (Cratægus pyracantha)

Viburnum (V.)
Arrow-wood (dentatum)
Withe-rod (cassinoides)
Maple-leaved (acerifolium)
Hobble-bush (lantanoides)
*Cranberry-tree; Eu. Snowball (opulus)
American Snowball (oxycoccus)
*(tomentosum)
*European Wayfaring-tree (lantana)
*Japanese Snowball (plicatum)

Weigela (W.)
*(amabilis)
*(candida)
*(rosea)
*(rosea fol. var.)

SHRUBS—*Continued*

Weigela—*Continued*
- *(Desboissii)
- *(Lavallei)
- *(Abel Carriere)
- *(Eva Ratka)

White Alder (Clethra alnifolia)
Winterberry (Ilex verticillata)
Witch-hazel (Hamamelis virginica)

*Xanthocera sorbifolia
Xanthorrhiza apiifolia

VINES

*Akebia quinata
Ampelopsis (A.)
- Five-leaved (Woodbine) (quinquefolia)
- *"Boston Ivy" (Veitchii)
- *(tricolor)

Bittersweet (Solanum dulcamara)

*Clematis paniculata
- *Jacqmannii
- *flammula
- *Henryi
- *coccinea
- *lanuginosa

Climbing Bittersweet (Celastrus scandens)

*Euonymus radicans
*Euonymus radicans fol. var.
*Everlasting Pea (Lathyrus latifolia)

Grape (Vitis)
- Summer (æstivalis)
- Northern Fox (labrusca)
- *European (vinifera)

Hedge Bindweed (Polygonum scandens)
Honeysuckle (Lonicera)
- Trumpet (sempervirens)
- *Japanese (japonica)
- *Hall's (Halleana)
- *(brachypoda)

Ivy (Hedera hibernica)
Ivy, Poison (Rhus toxicodendron)

Juniper (Juniperus squamata)

Periploca græca
Periwinkle (Vinca minor)
Pipe-vine (Aristolochia sipho)

Rose (Rosa)
- Climbing or Prairie (setigera)
- Baltimore Belle
- *Field (arvensis)
- *Wichuriana
- *Crimson Rambler
- *Yellow Rambler

*Schizophragma hydrangeoides
Smilax rotundifolia

VINES—*Continued*

Trumpet-flower (Tecoma)
Common (radicans)
*Large-flowered (grandiflora)
Wistaria (W.)
*Chinese (sinensis)
(fruticosa)

A botanical list of all the trees, shrubs, and vines in Central Park will be found at the end of the book, page 425.

From mountain-top to sea-shore the profusion of trees, shrubs, and vines—summarized as *landscape vegetation*—less difficult of identification than the minuter, more hidden forms of growth, affords more constant opportunities for entertaining research than any other department of natural history. The areas favorable for the other sciences are more or less local and restricted; but these three growths are everywhere, the universal garb and ornament of nature: they appeal to the most casual observer, are a constant incentive to observation, and their study yields its reward in the appreciation of a thousand details of scenery that escape the careless eye.

The significance of Central Park, as the background of our proposed narrative-picture, is not in the wide repute of these spacious grounds, but in the fact that in this area, accessible, within an hour's ride, to about one-twentieth of the population of the whole United States, is a remarkable epitome of these three types of vegetation, showing the best representatives of hardy native and foreign trees, shrubs, and vines. Here we have a sort of arboretum, and the best sort, not with genera and species

in tabulated regularity, as in the dead herbarium, but disposed with reference to their contrasts and harmonies, and showing their place in nature—miniature landscape scenes, with nature's spirit and atmosphere, more educating than the completest scientific arboretum in the world. Art has here conspired with nature only to show nature at her best.

This work is designed for the uninstructed nature-lover, who wishes help in learning the multitudinous forms of landscape growth all around him, without the labor of preliminary training in botanical science. It will be found of great convenience, moreover, to the more experienced botanist; for, in scientific works, the classification being based upon the details of the blossom, no help is there afforded for identifying a species except in the short flowering period. But almost every tree, and a large number of shrubs and vines, by the groupings of this book, can be learned simply from the leaf and other features of growth, and it therefore avails for fully half the year; and by the Analytical Keys every species can be more quickly found than any botanist can do it by the current method, even with the flower in hand.

No criticism is here intended of the prevailing method of classification by the often microscopic resemblances in flower and fruit: it is not only the most valid system as yet devised, but is indispensable where thousands of plants are concerned. The following work, however, excludes four-fifths of our entire flora from consideration, and a much simpler grouping is feasible. Moreover, the trained botanist regards the matter from

one point of view, and the mere wandering nature-lover from quite another; and for the latter, the method that makes brothers (or at least cousins) of the great laurel and the lowly pipsissewa, of the frail little bunch-berry and the great sour-gum-tree, is certainly not a serviceable one. Science represents the ripest thought of the world's most patient and gifted thinkers, and its methods are never to be spoken lightly of—but it *is* fearfully dogmatic; too much so, considering its extreme agility (acquired through long practice) in changing its attitude to square with new and victorious truths which it could not overthrow. Evolution, of the most ultra sort, is one of these winning truths, to which the scientific world is fast surrendering.

No previous knowledge of botany is here presumed upon. The descriptions, to which one is referred in the Key, contain few technical terms, and these, if not self-evident, are fully explained and illustrated. Only the obvious features of leaf and blossom needful for identification, *and requiring no microscope*, are presented. By this condensation all native and naturalized trees, shrubs, and vines found in the prescribed territory are described in about a hundred pages.

The area covered by the work—as regards our native plants—is the Northeastern United States—from Maine to Virginia (inclusive), and west to the Mississippi—whose flora contains, approximately, 170 species of trees, 197 of shrubs, and 127 of vines. Supplemental to this is a similar description of the foreign

(unnaturalized) and the native (extra-limital) species in Central Park.

In trees, the leaf affords the principal basis of arrangement, and the flower is secondary; but, for the still easier identification of the numerous ornamental flowering trees, a second Key is added, to serve in the flowering season.

Shrubs, having in general less distinctive foliage than trees, very often require the flower for absolute certainty: the blossom, therefore, affords the principal basis in the grouping of this section, with a second Key based only upon the leaf, wherein over a third of the shrubs are traceable to groups of only from two to twelve, so that most of them can be determined without the flower.

Vines are grouped primarily according to their method of growth, as, trailing on the ground, twining, climbing by tendrils, or climbing by rootlets, and are further subdivided according to differences of leaf and flower.

It is the prominent part of the flower—the corolla—that is emphasized, the minuter parts—calyx, stamens, and pistil—having much less importance in this scheme and all that is needful to understand of flower-structure is fully explained at the end of the work, and can be learned in an hour's time. For conciseness a few simple technical terms are used, which are either self-explanatory or are fully defined. The aim throughout has been to reduce the brain-effort of the student to a minimum. In addition to this more formal part, are several chapters designed to bring the matter home to the reader in a more intimate and attractive way, roaming at will wherever the vista proves inviting, now with the atmosphere

of spring in every scene, and later amid the vanishing glories of autumn days.

For a definite background on which to project the picture of tree-life, and to call more distinct attention to its unrivalled opportunities for botanical study, Central Park has been chosen as perhaps the most extensive illustration in this country of landscape-gardening, where nature has been not so much assisted as left untrammelled by superfluous growth, to work out her own ideals of beauty and dignity. The reader is in imagination taken along a few of the real paths in this nature's garden—threads on which to string such accounts of the adjacent growth as will appeal to his mood of sentiment rather than of science, and perhaps help him to realize the charms hovering all around in the great out-of-doors, and only needing mention to be recognized.

But soon the inborn naturalist will find the Park a gilded cage ; and his soul will long for mountain, plain, and valley, the arena of nature's grandest as well as most delicate accomplishments. The slightest human touch mars the grace of many woodland growths, which must be sought where they flourish in native simplicity.

Although these pages are designed for popular reading, the botanical names of plants, according to the revised nomenclature, have been added, for convenience, to their detailed description. Yet I am free to confess that I am much less concerned to learn the latest approved scientific name than to discover the spirit and special significance of a plant. My thanks are due to several of the Park officials for their most cordial and valuable assistance in the preparation of this work.

TREE LIFE

"Are not these woods
More free from peril than the court?"
—SHAKESPEARE.

THE next best thing to getting the reader out among the trees is to bring the trees home to the reader, and this I have endeavored to do in subsequent chapters, which aim, not so much to present a few bare facts—statistics and purely botanical lore—as to be a sort of cordial introduction to the numerous arboreal individualities all around us, and to help the novice to find a new significance in natural scenery.

In order to realize the extent and variety of tree-life, which makes this section of our vegetation so important, it will be well to preface the description of particular species by a broad survey of our native sylva. The best method of grouping the species, for such survey, is by the variations in some conspicuous feature common to all the trees; and by such subdivision the majority of nearly two hundred species can easily be remembered.

For this purpose we take the blossom, in which the variations are more radical than in any other part of the plant. For those who feel that all classification should proceed upon the orthodox lines laid down in current botanical science it may be a satisfaction to know that

to a great extent the following groups present substantially the affinities recognized by rigid science: and—as our present purpose is not to teach botany, but simply to help the reader to enjoy nature—we do not feel obliged to apologize for the few discrepancies. A bird's-eye view of the trees of the Northeastern United States is all that we are here attempting to present.

A few simple but interesting facts in flower-structure will make the principle of our classification apparent.

All trees produce flowers, that outgrowth that eventuates in fruit of some sort; but the flowers are of two very distinct sorts; one found in deciduous trees (shedding their foliage in fall), the other in evergreens; but here the distinction of foliage suffices to differentiate the two groups.

In the flower-type of the great deciduous group, containing all except evergreens, and comprising more than nine-tenths of all our species, a complete blossom consists of four distinct parts—calyx, corolla, stamens, and pistil; and the evolution of this type from the simplest to the most elaborate form shows a most interesting series of gradations. Lowest in the scale are those trees whereon one flower consists only of a few stamens containing pollen, another of only a pistil or seed-case to be fertilized by the pollen, neither of these flowers with the slightest vestige of either calyx or corolla (which botany calls the "floral envelope" of the blossom). Willows and poplars produce this rudimentary flower.

A little higher in the scale such staminate and pistillate flowers as we find in willows have a rudimentary

calyx, but no corolla; still higher, each has both calyx and corolla; next, stamens and pistils are combined in the same flower, but without calyx or corolla; then with only calyx, and, last and highest of all, the complete flower contains all four parts, each variously elaborated according to the species.

This is substantially the order of gradation from the rudimentary willow up to the gorgeous rhododendron and the magnificent yulan. But for our present purpose it is sufficient to observe that the very manner in which the blossoms are *clustered* on the tree is to a great degree indicative of their stage of evolution, the most rudimentary of the foregoing types being generally crowded in long, slender, pendent tassels, called catkins or aments, whereas the more complex types are either in large single flowers, as in the tulip-tree or magnolia, or, if clustered, never in the form of the slender, crowded catkin, but loosely conjoined, as in the apple-tree, horse-chestnut or locust. Thus, using the catkin or ament as the criterion, all deciduous trees fall into two groups, the amentaceous and the non-amentaceous; the latter, as having the most elaborate type of blossom, we will consider first.

In the non-amentaceous group, the flower, by the elaboration and size of its parts, and by conspicuous coloring, is more or less ornamental. To one whose casual acquaintance with trees is mostly summed up in half a dozen species, such as maples, elms, oaks, and hickories, it is a surprise to think of any tree—save perhaps an apple or cherry—as being covered with bloom, delicate and brilliant as that of our choice herbaceous

plants, and that a large section—more than a quarter—of all our native and naturalized species are not less worthy of cultivation for their luxuriant display of flowers than are the ornamental shrubs. For the clearer view of the matter we therefore divide this non-amentaceous group into two parts, the first containing those trees that are often quite as notable for their beautiful floral display as for fine foliage or imposing figure. These are the

ORNAMENTAL BLOSSOMING TREES

Silver-bell-tree
Flowering Dogwood
Red Bud
Wild Apple
June-berry
Catalpa
Black Haw
Tulip-tree
Common Locust
Clammy Locust
Wild Yellow Plum
Red Maple
Papaw
Umbrella-tree
Ear-leaved Umbrella-tree
Small Magnolia
Great-leaved Magnolia
Cucumber-tree
Loblolly Bay
Sweet Leaf
Fringe-tree
Sweet Viburnum
Yellow Wood
American Mountain-ash
Horse-chestnut
Ohio Buckeye
Sweet Buckeye
Purplish Buckeye
Red Buckeye
Sour Wood
Cockspur Thorn
White Thorn
Black Thorn
Washington Thorn
Summer Thorn
English Hawthorn
Downy-leaved Hawthorn
Dotted Haw
Southern Buckthorn
Alternate-leaved Dogwood
American Holly
Wild Black Cherry
Wild Red Cherry
White Alder

The following list contains the remaining non-amentaceous trees of our territory, whose bloom is

mostly inconspicuous, which results in part from its minuteness and partly from its dull coloring.

INCONSPICUOUS-FLOWERING, NON-AMENTACEOUS TREES

Sour Gum
Persimmon
Sassafras
Alligator Pear
Large Tupelo
Basswood
Downy-leaved Basswood
White Basswood
American Elm
Slippery Elm
Corky White Elm
Winged Elm
Nettle tree
Alder Buckthorn
Planer-tree
Sweet Gum
Buttonwood
Devilwood
Kentucky Coffee-tree
Poison Dogwood
Ailanthus
Staghorn Sumach
Hop-tree
Angelica-tree
White Ash
Red Ash
Black Ash
Green Ash
Blue Ash
Carolina Water Ash
Silver-leaf Maple
Ash-leaved Maple
Sugar Maple
Striped Maple
Mountain Maple
Cut-leaved Maple
Honey-locust
Water-locust
Prickly Ash
Red Mulberry
White Mulberry

The amentaceous (catkin-bearing) trees exhibit the lower flower-types as explained above, and the flower-clusters as a rule are not in the least degree ornamental; but the rule has a few notable exceptions, as in the chestnut and some of the birches, the graceful effect of whose long, pendent tassels, white or golden, is not inferior to that of many of the more pretentious blossoming trees. In the beech the catkin takes the form of a globular mass.

The amentaceous group admits of a natural and very evident twofold division, according as the ripened fruit is a nut or a seed (or seed-like)—one of those convenient distinctions that science deigns to make use of, though the difference is apparent rather than real, a nut being only a large, meaty seed, and a seed being essentially a diminutive nut. Moreover, the species of each division exhibit in common a very distinctive tree-type, for in the nut-fruited group are our finest forest-growths; these are our great lumber-trees, for the most part tough-fibred, often coarse-grained, utilitarian, like chestnut, hickory, and oak; whereas in the seed-fruited group are the more delicate and graceful sorts—willows, poplars, birches.

The following are our

NUT-FRUITED AMENTACEOUS TREES

Shagbark Hickory
Black Hickory
Western Shagbark Hickory
Small-fruited Hickory
Pignut (Hickory)
Bitternut (Hickory)
Pecan Hickory
Butternut
Black Walnut
Chestnut
Beech
White Oak
Swamp White Oak
Chestnut Oak
Yellow Chestnut Oak
Scarlet Oak
Red Oak
Black Oak
Barren Oak
Spanish Oak
Pin Oak
Post Oak
Bur Oak
Willow Oak
Water Oak
Shingle Oak
Live Oak
Upland Willow Oak
Chinquapin

The fourth section of deciduous growth contains the

SEED-FRUITED AMENTACEOUS TREES

Shining Willow
White Willow
Long-leaved Willow
Peach Willow
Purple Willow
Glaucous Willow
Heart-leaved Willow
Black Willow
Brittle Willow
Osier Willow
Weeping Willow
Scythe-leaved Willow
Bebb Willow
Sweet Birch
Paper Birch
White Birch
Yellow Birch
Red Birch
Common Aspen
Large-toothed Aspen
Lombardy Poplar
Balsam Poplar
Downy Poplar
Balm of Gilead
Cottonwood
Angled Cottonwood
Hornbeam
Hop Hornbeam
Sea-side Alder

Evergreens, comprising about one-tenth of all our species, are in some respects the most characteristic and effective of all arboreal growth. Of formal aspect and imperturbable temperament, they may be less responsive to our own natures than the livelier and changeable deciduous trees, but their unique figure and dark, massive foliage are the finest possible foil for all other vegetation. Summer and winter they ever stand like cooling shadows in the landscape. Pines allure the sighing breeze, and fill the air with pleasing melancholy; spruce and fir are cold and statuesque, responsive only to snowdrifts; red cedar and arborvitæ in artificial culture are as immobile and passionless as mummies, whereas in nature's hands, who makes the most of everything, they often beautify a scene remarkably. The

hemlock, never so stately and distant as spruce or pine, is the most gracious of all its kindred.

Clustered in darksome dignity, and swept by the north wind, their communings are undoubtedly the most serious of all their race. They never wax nor wane, like other trees; the thrill of spring-time and forebodings of autumn are alike unfelt, as they maintain their age-long course with frigid equanimity. But every nature-lover feels the refreshment of their rich dark forms, and will delight in studying their peculiarities of species and genera no less than those of the deciduous sorts. Pine, spruce, fir and cedar will then be something more than vague distinctions, and the one simple scheme of arboreal growth will here be found curiously diversified.

The following is the list, found in our territory, of

EVERGREEN TREES

White Pine
Red Pine
Yellow Pine
Pitch Pine
Loblolly Pine
Jersey Scrub Pine
Northern Scrub Pine
Table Mountain Pine
White Cedar
Red Cedar
Balsam Fir
Southern Balsam Fir
White Spruce
Black Spruce
Red Spruce
Norway Spruce
Hemlock
Arborvitæ
Larch (coniferous but deciduous)
Bald Cypress (coniferous but deciduous)

The five foregoing lists help one to realize the abundance and variety of our sylva, and this method of

grouping will assist the memory in recalling the species. Summarized, the classification is as follows:

Deciduous Trees: non-amentaceous:
Ornamental Flowering 44
Inconspicuous Flowering 41
Deciduous Trees: amentaceous:
Nut-fruited 29
Seed-fruited 29
Evergreen Trees: cone-bearing 20

The characteristics of all these species will receive attention in other chapters.

Botanists, in their eagerness to get the name of a plant, seldom pay any regard to the leaf, except as it helps to identify the species; generally they hardly stop to admire even the blossom (if there be any left after pulling several to pieces to find the structure). Money-misers are not the only misers; botanists are misers, in their mad haste to add another and another to their growing list of species, taking no real enjoyment in what they have already accumulated. This is no slander; I have been a botanist, and know the fever of acquisition.

A leaf is the whole tree in miniature: stem, midrib, lateral veins and veinlets—the leaf's skeleton—are minute copies of trunk, branch, and twig, and the chlorophyll is the foliage. This is one of the unities of nature, showing the massive elm and its tiniest leaf modelled alike. Of all the variable features of a leaf none contributes so much to the beauty of foliage as the fringing of its edge, as in the maple, birch, and elm, which in the

mass produces a thousand shimmerings of light and shade, ever grateful to the eye, as compared with the characterless type of leaf in the sour gum, sassafras, and osage orange. Although a leaf is not as important as a tree's other features for showing its character, a little observation convinces one that none other exhibits more peculiar and interesting differences. Nothing will create such an instant respect for this atom of vegetation as the accurate drawing of half a dozen kinds.

The most ponderous volume ever published is the ancient record of this earth, compiled during thousands of years, and imprinted in the rocks deep-buried in the dust of ages, which here and there protrude their leafy edges. If all the pages shall ever become accessible, and their chirography legible, the massive work will excite the profoundest interest—probably the one record capable of surviving the ultimate wreck of earthly literature. An interesting page of that long history is the testimony of fossil trees—rhododendron, oak, sweet gum, persimmon, etc.—as to the climatic changes that have swept again and again over the world, alternately exterminating and fostering the various forms of animal and vegetable life.

In this account we read that magnolias, now a subtropical growth, once adorned the landscape of Greenland. It is hard to conceive of the present flora of Virginia as having ever flourished far up within the icy regions of the arctic circle. What vicissitudes vegetation has experienced in by-gone ages! Now banished by

bitter cold, then coaxed back by tropic heat, the shifting forests tell a tale of more remarkable migrations than ever were accomplished by bird or beast. The stupendous devastations of prehistoric times, mutely evidenced by these buried trunks, only make the more mysterious the ultimate destiny of this globe, if commensurate with the infinite pains and ingenuity, and ages long of fire and ice, consumed in preparation.

CENTRAL PARK

" No other noyse, nor peoples troublous cryes,
As still are wont t' annoy the walled towne,
Might there be heard: but carelesse Quiet lyes,
Wrapt in eternall silence farre from enemyes."

—SPENSER.

AN admirable feature of Central Park is the fine adaptation everywhere displayed. Each tree, shrub, and vine, with artful ingenuity, is made to show its best. Here, the water-loving hornbeam hovers over the lake as if nature had put it there, and the tall cottonwoods bathe their roots at its brink. Yonder, staghorn sumachs, in October's crimson, are gloriously massed, as they so like to be upon the hillside; the graceful drooping white birch stands solitary in an acre of greensward; a large cluster of magnolias gives a touch of tropical luxuriousness; the group of buttonwoods is a noble bit of forestry; black haw, honeysuckle, and viburnum shrubs are scattered with unstudied effectiveness; stony embankments have allured bittersweet, trumpet-flower, matrimony-vine, wistaria, and ampelopsis to trail in graceful profusion, and double rows of grand old elms on each side of the Mall are colonnades and vaulted roof to frame the finest vista in the Park.

The flowering wonder of spring in these spacious

grounds is the Chinese magnolia, called yulan, standing a hundred feet from the Webster statue, near the Seventy-second Street entrance, West. The first view of the tree in full bloom fills one with amazement. Winter's bleakness is everywhere, for it is now only the latter part of April, and the tree is entirely leafless; but its whole figure is a mass of pure, delicious white, beneath which every branch is hidden. But, quite as remarkable as the total effect, is the individual blossom, for its purity, texture, and elegance; coarse fibre is usual in objects that are adequate for long perspective, but not so in the yulan; its blossom is as superb in detail as in its thousand-fold aggregation—a cluster of eight large, thick petals, cream-white and deliciously fragrant, surrounding a yellow axis that ripens into fruit. If the rose ever abdicates her queenly throne I know of no blossom so eligible as this for the royal succession. When I first saw the tree, in the zenith of its beauty, I asked permission of a policeman to go on the grass to examine it closely; of course he refused—how else could he show his authority, and what are policemen for, except to thwart your wishes—but either he was not made of the right stuff, or expected a good "tip" from a poor naturalist, for he at last consented, with the injunction to "come right back," which I did, when I got ready; and when I told him what the tree was, he replied, "Well, *you* call it a Chinese magnolia, but *I* have been telling everybody that asked me about it for the last ten years that it was a *flowering dogwood*" (*!*). As the blossom of the dogwood is to the yulan's something as a Methodist chapel is to Solomon's

Temple, I feel that I have rendered a slight public service in putting a stop to this periodical misinformation and almost profanation.

Scarcely has the yulan's early beauty faded, when masses of bright yellow are seen in all directions in the Park —it is the forsythia in bloom, perfectly leafless, like the magnolia ; and in the evolution of plant-life what strange shock could have struck nature, and reversed her universal dictum of " first the blade, then the ear, then the full corn in the ear " ? But we are deeply grateful for the occasional anti-climax that she allows, for it lengthens considerably the flowering period ; and the hearty way in which she showers the earliest spring flowers upon us, from yulan to violet, shows that she is no cold, " impersonal force," but a cheery, motherly dame, that takes this way of smiling upon her children in the morning of the year, and we bless her for it.

The forsythia is probably the best early flowering shrub now in cultivation ; hardy, and a most profuse bloomer. There are three species in the Park, two erect, the other drooping ; in some situations the last is more decorative, but its flowers are not so abundant as in the others. The specific name of the principal variety is happily chosen, for its dark fresh foliage is truly *viridissima* until the middle of November.

April might well be called the golden month, the sun has imaged itself so multitudinously in the early inflorescence of tree and shrub and vine. On April 1st the beautiful cornelian cherry was in full bloom. This European shrub, or low tree, ought to be more widely cultivated for its early brilliant display. There are some

fine specimens a little west of the menagerie, at Sixty-fourth Street, East. The delicately scented spice-bush is soon a yellow mist throughout damp woods, and, plebeian as it is, is rendering artistic service in the Park, although it takes a million of its tiny flowers to produce a strong dash of color. Numerous Norway maples (the handsomest maple blossomer, next to the red maple, and often eclipsing it) are now in bloom, and add their quota to the prevailing tint, robed in countless clusters of greenish yellow flowers, like a sudden gleam of sunshine through a cloud-rift.

But it is the stately weeping willows that late in April are the centres of attraction in these grounds. Magnificent in figure, their long wiry pendent yellow branches, flushed with the yellow hue of myriad catkins and budding leaves, look like huge arboreal fountains of golden light. Throughout the year the Park shows nothing that is at once so majestic, airy, graceful, luminous; but it is an ephemeral display; in a very few days they assume a deepening green, the light fades out, other trees come into leaf, and the willow's peculiar glory has departed for another year.

These are a few chance glimpses; but the Park is full of them; scene crowds upon scene through the hurrying days and weeks, until the landscape lies beneath an icy mantle of repose.

One of the most interesting features of arboreal study, especially in winter, and one for which the Park offers better opportunities than any number of woodland walks, is the character of trees as expressed by their bared figures, into which far more individualism has

been compressed than into their varied foliage, which, however beautiful, the tree-student soon comes to regard as a rather unmeaning adjunct. In fact, the most superficial acquaintance with a tree is the knowledge of its leaf—only a card of introduction; foliage is but the garb it wears a portion of the year, and it conceals more than it reveals of vegetative nature. Whoever can name a tree in winter may assume to know it. Trunk, branch, twig, bark, grain, fibre, and even the dormant bud are all sealed with the sign-manual of some peculiar type, which is always distorted in forest-growth, but has become realized in the favorable surroundings of this great nature-garden. Never go to the deep woods to study trees. A dense forest is a mass of malformations, tall, spindling forms, each trying to overtop its fellows, as if gasping for breath and straining for the light.

In the single point of general figure, what contrasts in the forms of the overarching elm, the slanting-branched maple, the cylindrical tulip-tree, the round-topped, almost globular horse-chestnut, the beech wide-spreading with slender, horizontal, tremulously straight boughs, the angular, stubborn-visaged oak, the coarse-branched hickory and ailanthus, the spindling, effeminate Lombardy poplar, the curious ginkgo, the languid, refined white birch, the sprawling catalpa, all arms and legs like an ungainly school-boy, the spruce little aspen that ought to carry a little cane, the stately cottonwood, a senator indeed, the conical red cedar, the tall-shafted white pine, the king of trees.

How typical and ever varied the bark, one of the

most picturesque and interesting appurtenances of a tree, in no two species quite alike, not obtrusive yet assertive, to which we are more indebted for the *ensemble* of effect than most people ever imagine. It is this dark, rigid covering of trunk and branch, peeping through foliage, that gives stability, vigor, and expression, as every painter knows. Color and texture vary endlessly: browns and grays of every shade, with here and there a reddish and yellow, fill out the gamut from the Turkey oak's deep black to the silvery and chalky white of the gray and paper birches; and, over all this, stripes, bands, blotches and reticulations of infinite variety that so plainly characterize the tulip-tree, shadbush, chestnut, sophora, buttonwood, paulownia, Chinese mulberry, etc.

Observe, too, the texture and surface-finish of bark; deeply corrugated in sassafras and osage orange, smooth in birch and locust, unyielding in hickory and hornbeam, loose and friable in white oak and elm, etc.; also the three sorts of bark-exfoliation—in shagbark hickory, bald cypress and red cedar longitudinal, in all birches lateral, in buttonwood ragged and irregular; the speckled, warty or blistered surface in sweet gum, nettle-tree, balsam fir, etc., and the diabolical spines of Hercules' Club and honey locust. Every nature-artist tries vainly to reproduce the bold and picturesque conceits in black and gray and green upon the birches' white ground. In all botanical life there is scarcely a greater mystery than the infusion of such varied character and beauty into what are really the cracked and worn-out garments of the trees—dead husk converted into ornament.

Of the many tree-students I have seen, not one has

failed to be more interested in this aspect of the matter —the heart and marrow of the thing—than in the superficial dress; there was none who did not prefer the early spring walk in the leafless woods to the foliage-vistas of June. Trees and birds are alike in this respect, that the best time to begin their study is in January; it gives aim for winter-rambles where one can note the sinewy strength and the majestic pose of these noblest creatures of the soil, many of which were living their sturdy life before our day, and will abide in undiminished strength long after we have passed away.

The foregoing are but a few of the differences in tree-species; to the tip of the tiniest twig, through all their fibre, and to the core of the heart-wood, individuality is stamped upon them. Penetrate below the surface of the trunk, and note the coloring of the tree's lifeless centre—for the interior of every sound tree is as dead as a post, the life is all in the outer layers next the bark, and in the juicy twig and leaf; yet in rather comical contradiction the defunct interior is called "heart-wood"—cut to the centre, and find it crimson as blood in the red cedar, black in ebony, white in basswood, yellow in the yellow-wood, and in many cases with fanciful ingrained designs, as in bird's-eye and curled maple.

In the requirements of human life what diverse qualities in timber are demanded, and all of them are met by the varying grain and texture of our trees—the horse-chestnut for artificial limbs, holly for engraving-blocks, maple and sweet gum for fine cabinet-work, ash for furniture and oars, elm for wheel-hubs, black walnut for gun-stocks, hickory for agricultural implements, white

birch for spools, red cedar for lead-pencils, red birch for wooden-ware, hornbeam for tool-handles, white oak the stanchest for ship-building, post oak for railway tiers, shingle oak for shingles, beech for chairs, crack willow for baskets, aspen and cottonwood for paper, pine for masts and piles—though each of the foregoing is serviceable for other ends; and for an epitome of timber uses, and to learn what a cosmopolitan affair a one-horse shay is, consult Oliver Wendell Holmes.

A strange idiosyncrasy of trees is the gregarious habit of some species and the solitary life of others. Oaks and maples often cover large areas, and some vast forests are composed chiefly of spruces or birches; but the hop-hornbeam, the buckeye, and the elm grow singly, and the Kentucky coffee-tree, one of our rarest sorts (one or two are in the Park), is always found alone; pines show a very sober sociability. And how slight a modification of soil or climate proves an insuperable barrier to the further range of many species. Some, that are moderately abundant in Northern Pennsylvania and New Jersey, suddenly disappear just across the State line in New York. Alders and willows congregate by the water, moose-wood loves the mountain range. Most species require plenty of sunlight, but the papaw and striped maple seem quite contented in the shade.

Why do the larch, willow and alder respond with such alacrity to the earliest vernal influences, while the linden, paper mulberry, and catalpa are so tardy? The energetic horse-chestnut has developed all its dense foliage ere the ailanthus betrays a single sign of life.

Do trees possess nervous and lymphatic temperaments? Their times of budding are as various and constant as the migration-dates of birds, and seemingly as irrespective of the weather. There is the same periodicity in autumn's decadence; the butternut begins to look very untidy in August, the freshness of the elm is gone early in September, not a leaf is on the linden while yet its companion maples are in their full glory, and the weeping willow, as though loath to give over its weeping, holds its rich green untarnished till into November.

Not less mysterious is the rapidity of growth in some species, and its extreme slowness in others. Young cottonwoods show a marked increase in size not only from year to year, but almost from month to month; these are being planted largely in the streets of New York City; others are almost stationary from one decade to another, like the holly, of which one specimen is known to have spent a hundred years in attaining a diameter of five inches. Maples grow rapidly, elms slowly.

And how varied and fixed the term of life in this and all other flora. With a powerful microscope we might almost see the date of its extinction stamped on every seed. Barring all contingencies the white birch is doomed to an early death; the most flourishing colony of this species is picturesquely strewn with many a prostrate form; but elms are centenarians, the mulberry has often reached the age of three hundred, oaks and lindens may survive for nearly a thousand years.

"Three centuries he grows, and three he stays
Supreme in state; and in three more decays."

How inherently graceful and how incorrigibly ungainly different species are! What provincialism in the apple-tree, that never had an ungracious thought in its life, and what a type of an exquisite the tulip-tree is; yet the latter is an utterly loveless creature, while the homely apple-tree's dear old deformities are buried fathoms deep in virtues.

One cannot study trees without being quickly reminded how nature's changeful temperament is echoed or reflected in everything around him. Clouds mass themselves according to season; winds know the time of the year, and tune their airs accordingly; November sighs are never heard in summer nights. Yet what one sees depends more on the seer than the seen. Thoreau got more than a European trip out of a little tramp from Boston to Mount Wachusett, only fifty miles away; but he was one of the few that can get the satisfaction of a diamond out of a dewdrop.

It seems strange to think that undulations of air go on and on in noiseless flight, becoming *sound* only when they reach a living ear, much as lake-waves roll on in silence till they break upon the shore; that rays of light are dark as night until they strike a living eye. Tempests sweep over the mountain-sides and break down trees, but there is no *roar* in the forest-tops, except there be an ear to hear it; otherwise the silence of the grave prevails throughout the turmoil. Solar rays, though they pierce to the remotest star, after the lapse of many thousand years, can never become *bright* unless they strike an optic nerve. The interplanetary spaces are not luminous, unless there be a spectator of the scene.

Much the same that the shore is to water-waves, the ear to atmospheric undulation, and the eye to ether-waves, is the human heart to the impressions of nature. The deepest, truest beauty there is not objective, self-existent; its forms and even its colors are largely transmuted into beauty by a reaction of the soul; and that reaction or responsiveness is the giving back to scenery our thoughts—our anticipations and memories, joys and sadnesses, our very moods, which all become interwoven with the scene, and show back to us, from forms and colors of the mountains, valleys, trees, and clouds. This interblending of nature and ourselves we may be well assured of, though it be an unfathomable mystery.

Thus what we get out of nature is largely what we have put into it, and that is why nature becomes more and more to us as we grow older. The child finds very little there, only what appeals to eye and ear, for he has put little or nothing into it. Wordsworth sums up the matter in a word when he says,

> "Minds that have nothing to confer
> Find little to perceive;"

and what can we confer upon nature except our very selves?

And this mirror-like quality is the most delightful feature of nature, enabling almost every object in it to become a centre around which the imagination can play interminably. Even an old, dead, wayside post may be the garner of pleasant thoughts (else why is it put into pictures); how much more such living, stately, and graceful figures as trees and vines. Where is the soli-

tude, with such eternal company? And these things have that best of all friendly tact of somehow always blending with our own humors—ingenious sympathizers with the ups and downs of life. Art thou in sorrow, the mournful pines sing the same sad song; nature echoes all our joys, and they are emphasized; she mirrors all our glooms; but they are so softened as to be almost rubbed out; and we find painted there, what no other artist-colors can reproduce, in spring our prospects, and in fall our retrospects.

With such running to and fro of our thoughts it is not strange that one scene will often call up another scene that is in striking contrast; and there is a peculiar reminiscence of spring atmosphere and bloom when in the changed autumnal days we look upon the cool, ripe fruits of black haw, thorn-tree or mountain-ash, shining in the September and October sun. Sometimes brilliant colors thus ripen out of inconspicuous flowers, but commonly it is the fine blossom that develops into showy fruit.

Berries of every tint—white, blue, red, purple, black—hanging amid the russet foliage reward an autumn's walk in every woods, some only fit for show, others tempting morsels for the winter birds. Almost the earliest are those of the alternate-leaved dogwood, whose dainty blue clusters on bright red stems can be found toward the last of August. Then come the white berries of the panicled dogwood, with the deep blue fruit of the silky dogwood, and the large black clusters of the maple-leaved arrow-wood; surely such splendid-looking berries must be edible; you try it—and you will never try it again.

Clambering over low shrubbery is the scarlet-fruited nightshade or bittersweet, more brilliant but less abundant than the orange fruit of the other bittersweet or wax-work. Late in September the brilliant berries of the spice-bush gleam like coals of fire amid the dark foliage. This plant has already done considerable of its work for next year, for the branches are thickly strewn with flower-buds for early spring display. Hanging from a rocky wall, drooping, or prone on the ground are the long branches of the matrimony-vine (*Lycium*) with a medley of unseasonable blossoms trying to make it summer again, and a harvest of oblong, pink-scarlet berries, and the flowering dogwood begins to glow in leaf and fruit.

A sharp surprise is the winterberry that, having had nothing particular to say thus far in the season, has wisely kept silent, but now suddenly comes out with some felicitous after-thoughts, in the shape of a prodigal abundance of bright red berries, the size of a pea. This and its near relative the inkberry find their way into florists' windows to help the suffering rich to endure the severities of winter. Now the mountain-ash is heavily laden with its large clusters of dull red, and the various thorn-trees are beginning to please the eye and to prepare a winter's feast for hungry birds, which ignore the thorn-berries at first, but become less fastidious toward spring, and have learned from experience or from Shakespeare that hunger is the best sauce. In October the black haw, last May in bridal robes, seems almost in mourning, so thickly hang its blue-black clusters. For weeks and months snowberry and coral-

berry will retain their pure white and dull red globules, and nothing is finer for brightening snowy ground than a low thicket of Chinese barberry, almost glittering with its thousands of scarlet drupes, while a single tall "burning-bush" is a permanent conflagration. Earliest of all, the sumachs lift their dense pyramids of fire, summer's torch-bearers, to spread the flames broadcast through field and forest.

But it is with neither flower nor fruit that nature produces its masterpiece of landscape scenery, but with the foliage of unnumbered trees, when in autumn the mountain slopes and valleys are as gorgeous as if strewn with sunset clouds. Now come

"The golden days fruitful of golden deeds."

How trivial the display of earlier months against this avalanche of color! What rivalry of trees in all this symphony of tones, when the severe oaks and sombre gum-trees, that never before had a thought of brilliancy, beech, poplar, maple, dogwood, sassafras, suddenly display a genius for rich hues that put summer's fairest flowers to the blush, and picturesquely strew the ground with ephemeral mosaics.

In tabulating the trees according to their autumn coloring it must be remembered that in different years the coloring varies greatly, both in amount and intensity, and that many trees of every species have only withered, colorless leaves. Also that in the gradual ripening of foliage the color often passes through several distinct shades, sometimes becoming darker, as in beech and hickory, sometimes lighter, as in ash. With these

qualifications the following lists are perhaps as accurate as can be made. The poet summarizes the matter correctly when he speaks of

"Autumn beaming o'er the yellow woods,"

for that is the color assumed by the great majority of species, as will be seen below; the yellows are of all shades, the first group containing only those in which it is purest:

BRIGHT YELLOW

Tulip-tree	Yellow-wood	Osage orange
Cucumber-tree	Wild black cherry	Black walnut
Ailanthus	Wild red cherry	Chestnut
Striped maple	Scarlet thorn	Common aspen
Judas-tree	Shadbush	Large-toothed aspen
Kentucky coffee-tree	Mulberry	Balsam poplar

PALE OR RUSTY YELLOW

Basswood	Choke-cherry	The birches
Silver maple	Papaw	Hop-hornbeam
Norway maple	Persimmon	Bur oak
Ash-leaved maple	Alternate-leaved dog-wood	Chestnut oak
Common locust	Silver-bell-tree	Beech
Honey-locust	Fringe-tree	Swamp white oak
Clammy locust	Slippery elm	Spanish oak
Mountain-ash	Butternut	Willow oak
Witch-hazel	Nettle-tree	Cottonwood
Spindle-tree	The hickories	The poplars
Hop-tree		

RED

White oak	Red oak	Pin oak

RED AND YELLOW

Horse-chestnut	Sassafras	Sweet viburnum
Mountain maple	Post oak	Angelica-tree

ORANGE, CRIMSON, YELLOW (more or less combined in same leaf)

Red maple	Cockspur thorn	Scrub oak
Sugar maple	Dotted haw	Hornbeam
Sweet gum	Black oak	

SCARLET

Sumachs	Scarlet oak	Black haw
Flowering dogwood	Sour gum	Sorrel-tree

BROWNISH

White ash	Blue ash	American elm
Red ash	Black ash	Buttonwood

The oaks—particularly white oak—hornbeam, and beech are the three sorts that retain their dried foliage through the winter, and saplings are more tenacious of leaves than full-grown trees.

I have made the Park my home in winter and in summer, in all sorts of weather, and watched its numberless transitions from the cold and brilliant glitter of its icy branches in January to June's perfumed air, when life is at the full; and thence through the maturer, sober, yet often more impressive scenes of the declining year. Such intimate association makes a spot one's own in a more real and satisfying sense than comes from merely mercantile possession, an ownership as inalienable as memory itself. But nature is too mighty to be mirrored in her grander moods in any park, however spacious. The scenery here is beautiful, the opportunities for studying minutiæ unsurpassed, the small *ensemble* effects most delicate; but the spirit is always that of sunshine,

never that of magnificent glooms and storms ; the arena is too limited for the wilder, more rugged views that so invigorate the soul ; and the roughness and artless negligence of the forest, mountain, and vale, the far horizon and the wind-swept lake, afford a range of pleasures never found where the scene comprises only a multitude of small perfections.

In nature's vastness human touch can neither mend nor mar her sublime effects. How magnificent is a great forest, how profound its eternal repose ! One leaves the din of human strife behind in entering its almost sacred precincts, a sort of temple not made with hands. In what restful, perfect silence works that immense machinery of life ! Tons of water coursing incessantly upward through all the trunks to their very tips, expansion in billions of twigs and leaves, consolidation of wood-fibre every instant, swelling of every bough and bole, the production of an immeasurable mass of flower and fruit, chemical action on the mightiest scale, by a forest energy as frictionless, inaudible, and irresistible as that which drives the planets in their orbits. Multiply the vital force of one such forest by the thousands that cover all the mountain slopes and plains, and how stupendous nature's enginery appears !

May not our sympathy with trees spring partly from the fact that they, more than other forms of vegetation, seem linked with us in a common mortality? Youth, manhood vigor, old age, and decay are theirs as ours : certainly with no other object in nature below the grade

of animal life have we the semblance of fraternal feeling, none other commands such an instinctive *respect.* Some ancient oak or elm, standing near the old home, with observant silence has entered into the joys and sorrows of a century of human lives; it seems consciously in the confidence of the whole family, charged with sacred secrets it will sacredly keep, and we begin to love that tree as if it were our own kin. Does not many a reader find some such old tree a central figure in the memory of his childhood home? A reminiscent mind can scarcely pass by such a majestic figure without suspecting that its broad, swaying boughs are whispering of by-gone days. If there be any conscious being in the world of vegetation, we surely find it here, spreading its cool, kindly shade over children and children's children, and stamped with the dignity of a long and useful life.

The impression of *age* belongs only to objects of growth. That huge bowlder perchance lying near our venerable friend, and a thousand times older—who ever gives it reverence? Spectator of all the tree has seen, it yet has no link with human life—a changeless, unresponsive granite rock. Is it not the frailty of mortality, the mystery of "a future all unknown," that overcasts the landscape with its finest tinge of sentiment, and gives almost a touch of sanctity to every evening twilight hour? Human nature is so taken with itself, that one of its most pleasing occupations is to feel the kinship of earth's lower types, and it never tires of finding itself mirrored there.

WOOD NOTES

"Nature here
Wanton'd as in her prime, and play'd at will
Her virgin fancies."

—MILTON.

IT is not when nature is in full flush of life, and the botanist does not find the long midsummer days long enough for the innumerable species springing into bloom on every hand, that the landscape shows those quickly varying effects that sweep like summer clouds in silent swiftness over hill and dale, and change the scene from day to day, almost from hour to hour. Spring and fall show nature's flow and ebb, each day another wave in the advancing or retreating tide. A single night gives new complexion to the mountain-steeps, awakening new patches of delicious green in spring, or kindling new flames of maple foliage in fall. It is the dawning life and the expiring breath in nature's annual career that furnish the most interesting vistas for the painter. With all their sombre majesty and eternal calm, what a wilderness of dull monotony a world of evergreens would be! How endless the verdure-tints of the new-blown buds in April and May, what a delicious softness of atmosphere overspreads them all, in contrast with the deeper and more rugged tones of later months. In the first gushing vernal days, when the

skies kiss the earth, the larches are sprinkled full of buds of rarest green; the honey-locust spreads a semi-transparent feathery canopy above your head that in clear May-light becomes a perfect dream of emerald; the large-toothed aspen now gives the illusion of a leafless tree in full white bloom; for each small leaf, like a cradled child of luxury, is deep buried in soft wool. Soon the white oak's opening buds almost rival the arbutus's delicacy of pink and white, and the weeping willow is wrapped in a sheen of gold. Wonderful are the innumerable artist-touches in the scenes that usher in the year. But one must be alert to catch the quick-dissolving views that make stupendous panoramas of our April and May days, scene melting into scene like transient dreams, and, ere we realize it, all the peculiar charms of spring have disappeared, only to live in memory until another year.

No plant is so plebeian as not to arouse a naturalist's enthusiasm when it can give to his hungry eyes some characteristic token of a reviving year that is always to be brighter and happier than the last—a fond mistake often made, and as often forgotten. No blossoms of all the year have quite the aroma and ravishing color of the earliest spring flowers; coming when the landscape is still drear, yet beautiful with the charm of an opening year, they are spiced with that best flavor of all happiness—expectancy.

In the same category as the fox sparrow, that warbles his rich, plaintive song in leafless trees, the trillium, that sends up fair white petals out of oozy ground, and all such welcome harbingers of spring, is the common lit-

tle spice-bush, with the faint fragrance of a universal kindness, that does in a humble way in moist woods what the forsythia is doing more brilliantly in more aristocratic surroundings on our lawns. The spice-bush is a pleasant thing, in foliage, flower and fruit, and they have not disdained to make considerable use of it in the Park, although I have a suspicion that, like some other wild things, it is not pleasantly disposed toward artificial treatment. Awake with the first bright color of the season (except perhaps that of the marsh-marigolds, often called cowslips) its leafless branches suddenly bursting into clusters of minute yellow blossoms just as the pine creeper and yellow redpoll arrive, this little shrub, planting itself everywhere, is the most conspicuous object in the bleak woods of early April.

Like the spongy soil, our memories are more impressionable for the earliest beauties of the year, so that the simpler things of April stir more enthusiasm than the much finer displays of May and June. Would the world really hold the violet and anemone in such affectionate regard, if they did not time their coming so as to monopolize our hearts, but delayed until they must be content with our subdivided affections? I hope that the world would bend as eagerly over a bed of violets or a flowering trillium in the "height of the season" as in the cold air and soggy soil of early spring; but I suspect that we annually become a trifle *blasé*, that the fine edge of our sentiments is a little worn off in summer, and it is a godsend that we have a winter in which to starve our eyes and recuperate our feelings.

But to return—the spice-bush does not feel that it

has done its whole duty by early rising, but follows up the floral display by a growth of dark-green, almost glossy, laurel-shaped foliage that has lost none of its freshness in the last of September, when brilliant scarlet berries peep out among the leaves in striking contrast, for rarely do bright fruit and deep-green foliage occur together so late in fall.

Individually, the flower of the spice-bush is as diminutive and ineffective as can be imagined, almost microscopic; but this is only one instance out of many in the floral kingdom that contradicts the old adage, and proves that quantity is sometimes quite equal to quality. With the exception of the magnolia, rhododendron, azalea, and one or two others, all of our most striking landscape inflorescence is produced by the vast aggregation of diminutive blossoms. Throughout the Park and in every lawn about the last of April the leafless branches of the forsythia are buried in small yellow flowers, looking like wands of gold; at about the same time, a tree here and there in the landscape is seen to have suddenly burst as by magic into snowy white; it is the shadbush or June-berry smothered in myriads of diminutive rose-shaped flowers; later the numerous black haws—tree and shrub—and wild black cherry tree, form snowy masses out of a million tiny flowers; still more inconspicuous are the separate blossoms of the Judas-tree—an anomaly in nature—whose every branch and twig seems dipped in blood, from countless tiny purplish-red flowers; a beautiful tree of this sort is in the Park not far from the Webster statue, and others not so large are on the east side. Of almost micro-

scopic size, too, is the blossom of the million-flowered African tamarix, a unique and superb shrub, handsomely represented in the Park in many places, and worthy of cultivation in every lawn; and as the most familiar instance of minute organisms aggregating into most brilliant masses of color, may be mentioned the countless spiry panicles of our commonest autumn weed, the golden-rod. But, although the sum-total is the greatest of all in this widely distributed weed and in the asters, the most impressive instance, to me, of nature's floral lavishness, is in the full bloom of a lofty, wide-spreading chestnut late in June, whitened with its thousands of long catkins, every catkin crowded thick with blossoms. The sense of nature's opulence sometimes becomes oppressive.

Of the multitudinous flower-types disclosed by the study of botany, the one adopted for the rose family seems to be nature's favorite, since both in flower and fruit that family has such commanding pre-eminence throughout the earth. Besides numberless varieties of the acknowledged queen of flowers, we have in this family group the wild apple, wild black cherry, black haw, shadbush, sweet viburnum, mountain-ash, Japanese quince, English hawthorn, cockspur thorn, black thorn, etc., with the many beautiful spiræas, all notable for inflorescence. Note also the fact that all our choice large and small fruits are from the rose family—peach, pear, apple, apricot, quince, cherry, plum, blackberry, raspberry, and *sans pareil* the strawberry—what

an array of universal favorites beautiful and delectable! But pre-eminent in its double *rôle* is spring's fair emblem, rustic, picturesque, and redolent of happiest memories, when heaven's breath fills the apple-tree. A large proportion of the bloom of this great family is linked with spring-time associations. It is very curious that the sour little crab-apple, parent stock of all the hundreds of apple varieties, should surpass all fruit-trees in delicious fragrance and rosy tint—a crabbed face, betraying by an unexpected gentle act, its kindly heart; almost every community has its saintly crab-apple.

The great attraction of a wood-ramble in early May, particularly in the southern part of our territory, is the abundant flowering dogwood, its rather uncouth figure suggestive of an apple-tree, but its luxuriant bloom, so massive and beautiful at a distance, not to be examined too minutely. It seems almost slovenly in nature to tip off so crudely the ends of the four petal-like bracts that pass by the name of "flower," and we are seldom so inclined to impugn her taste or good judgment; we botanists would certainly have managed the business differently. One quite forgets the tree after its spring beauty has departed—quite a usual circumstance, however, in human nature—but in autumn it returns to favor with its brilliant crimson leaf and berries. Early blossoms, showy autumn foliage, and late-hanging bunches of scarlet fruit give to the dogwood a more protracted period of ornamentation than is found in any other species. A red-blossomed variety, in cultivation and rarely found wild, is very effective when mingled with the white. Humbler members of the

same family are the alternate-leaved and the poison dogwood—oftener shrub than tree—the latter having the unenviable notoriety of being the most virulently poisonous growth in our woods; but fortunately it is rare.

The thoughts of the Eternal mind are not all of equal moment, any more than are those of finite creatures. There is something grander in universal gravitation than in the mere chase of ether-waves. Tipping the earth's axis a few degrees out of the plane of its orbit, whence instantly comes the entire succession of the seasons, with all this signifies to the human race—this is a more far-reaching thought than the moon's tides. The night sky shows more prodigious thought than any flurry of fire-flies; and evolution, rightly understood, seems more stupendous than the entire aggregate of nature's works. A little consideration shows that, in vegetation, we have distinct evidence of superior skill in the origination of the compound leaf; for this simple device secures an immense unrealized variety in foliage-effect. The exquisite symmetry of foliage in such trees as the ailanthus, locust, mountain-ash, and Kœlreuteria, is due to the precision of growth in leaves whose leaflets are arranged with wellnigh mathematical exactness along the common leaf-stem. Now, if these long stems were true branches, enduring from year to year, the injuries to which they and their buds would be constantly exposed would very soon result in such irregularity of leaf-arrangement as would utterly efface the original

scheme of ideal precision, and eventuate in simply a miscellaneous output of small leaves, neither so profuse nor so beautifully symmetrical as is invariably attained from year to year by the scheme of compound leaves, which can never degenerate into a medley of growth. Let anyone study the doubly compound leaf of the honey-locust and Kentucky coffee-tree, or the compound leaf of the ailanthus and walnut, as compared with the leaf-system in the elm and white birch, and it will convince him that under present conditions of growth, and with constant liability of derangement, that singularly beautiful leaf-pattern and the profusion and symmetrical effect of the foliage-mass could never have been secured, without resorting to the compound-leaf system. Horse-chestnut, hickory, sumach, butternut, ash, locust, and many others, are thus widely differentiated from oak, maple, hornbeam, beech, etc., producing a most pleasing variety.

Large, roundish leaves are comparatively ungraceful, and such trees as the catalpa, basswood, and buttonwood must have corresponding perspective, or be planted where the surroundings will properly offset the heavy, clumsy effect of such foliage. This is still more true of such magnolias as the cucumber-tree, umbrella-tree, and especially the large-leaved magnolia (*macrophilla*), whose heavy tropical appearance, strongly punctuating a broad vista, is a monstrosity in a small grass-plot, where only the graceful figure and delicate leaf-tracery of such trees as the cut-leaved or Japanese maple, the white birch, the Kœlreuteria, the mountain-ash or cut-leaved alder, are appropriate. For a dense

yet graceful effect in larger foliage-mass the cut-leaved beech is an excellent choice, and not disproportionate to quite a small lawn.

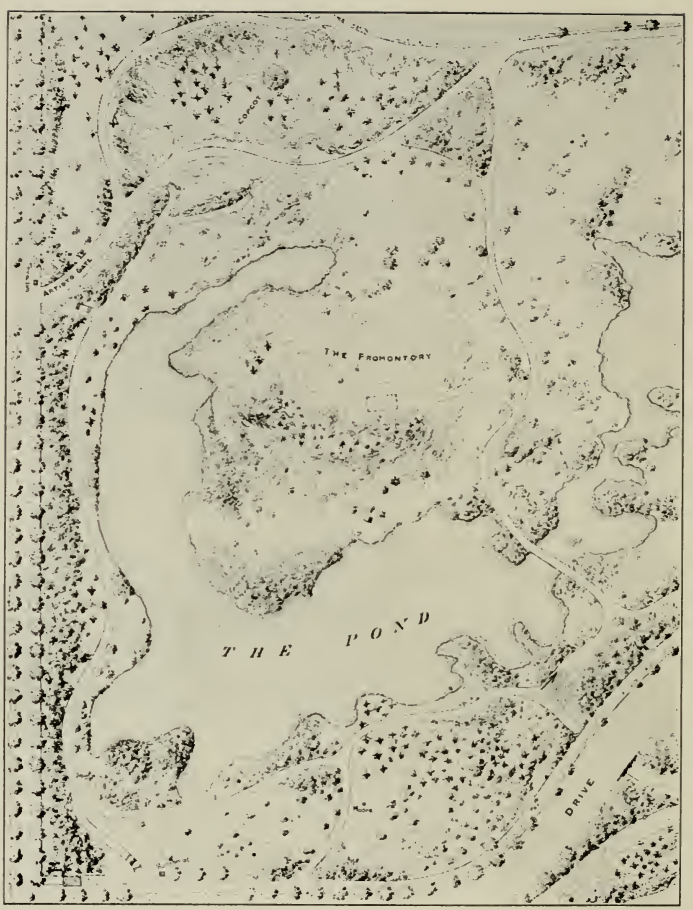
When young trees are planted thought should be taken of their ultimate effect when fully grown; this forethought would often induce the selection of dwarf species, such as Judas-tree, hop-tree, silver-bell-tree or hornbeam, which will not in the end so crowd their surroundings as rather to disfigure what they were intended to adorn, and crown the catastrophe by being finally cut down.

The advantage of tree-study in such a place as Central Park is not only that one acquires a discriminating eye to enjoy such growth anywhere, but, in the event of having his own grounds to decorate, be they large or small, he is not left at the mercy of a florist. Fine effects, and some that are inartistic, result from following the advice of one who has plants to sell, when the purchaser himself is helplessly ignorant.

The ideal for every lawn should be, that it shall have some distinctively attractive feature for every part of the year, and that its beauty shall not all be concentrated into a few fleeting weeks. Flowering vines, shrubs and trees should be selected with a view to their successive flowering, from the yulan, dogwood, forsythia, Japanese quince, shadbush and wistaria in early spring, to the catalpa, clammy locust, Kœlreuteria, sophora, and rose of Sharon in July, August, and September. Variety of foliage-effect in form and tint of leaf should be studied, mingling evergreens with deciduous trees, the dark holly and beech with the light-green cut-leaved

maple and white birch, the honey-locust with the white oak, with a sprinkling of tamarisk, weeping mulberry, and Lombardy poplar. Another consideration is early and late foliage. Norway and sycamore maples and the European beech are about two weeks in advance of most of the trees in vernation, and in fall the foreign maples, weeping willow, California privet, and frequently the forsythia, are fresh in foliage long after the others are sere and bare. To bring autumn's coloring to the lawn, plant the red maple, sweet gum, sour gum, dogwood and tulip-tree; and brighten winter's bleakness with the showy fruit of thorn-trees, mountain-ash, Japanese barberry, coralberry, and snowberry; while nothing is more conspicuous and beautiful amid the snow than the blood-red branches of the leafless red-osier dogwood.

These are the foremost points to be considered, in securing variety, harmony, richness, and continuous satisfaction in that bit of nature's garden that surrounds every country gentleman's castle. Too many treat their landscape-growth as they do the pictures on their walls, giving them little thought after they are purchased. Both of these adornments, indoors and out-of-doors, are dear at any price, if they are to be thus ignored; and it might almost be said that they are cheap at any price, if they become a part of our own life, as permanent objects of interest and affection.



THE POND

The arrow shows the starting-point and the direction of the route.

AROUND THE "POND"—FIRST EXCURSION

"Well may'st thou halt—and gaze with brightening eye!"
—WORDSWORTH.

FOUR short walks in the Park have been selected which bring to view the majority of our native and foreign trees; and the route in three of them is so obvious that one will have no difficulty in recognizing the adjacent growths herein described. The local coloring of the account will moreover make it less formal and more interesting to those who may not follow the routes prescribed.

Our first excursion is the circuit of the Pond (so-called)—the picturesque little lake at the southeast corner of the grounds. Starting a little south of the bridge conspicuously spanning it, then crossing it and bearing around to the left, one encounters successively, almost within hand reach, the staghorn sumach, a European oak, red oak, shining willow, Lombardy poplar, ailanthus, bald cypress, hornbeam, European alder, red maple, a fine cluster of five purple-leaved beeches, European elm, sycamore maple, American elm, a cluster of honey-locusts, Scotch pine, field maple, cottonwood, Kœlreuteria, weeping willow, European ash, white pine, horse-chestnut, scarlet-fruited thorn, a cluster of European beeches and a chestnut—

twenty-six characteristic native and foreign varieties, ornamental and strikingly different, comprised in a ten minutes' walk. In connection with such of them as we are now to describe particularly, we will speak of their kindred species, elsewhere in the Park, or in the country, and their especial differences.

STAGHORN SUMACH. — On the border between tree and shrub stands the staghorn sumach, aptly named from the striking resemblance of its velvety forking branches to the young antlers of a stag, a resemblance visible only when the tree is leafless. Though of low growth it is yet the tallest of the family, the only member aspiring with any success to arboreal dignity—and generally failing in the attempt. But occasionally one finds a specimen with an erect and rigid trunk, type of masculine singleness of purpose ; a few such are in the Park.

The large cluster of these sumachs at this point suggests a dense growth of ailanthus saplings, having the same form of compound leaf, but closer inspection shows the marked difference. The foliage is so dense, drooping and luxuriant as to present quite a tropical effect. It is finest in large shrubby masses, especially when blazing in autumn coloring, with a volume and intensity of scarlet that puts to the blush every other attempt at brilliancy save that of the sour gum or tupelo, which is a veritable sheet of flame.

OAKS.—The oak is perhaps our greatest hero, the Jupiter of all trees, as the white elm, "tall and divinely

fair," is the Juno. If the old mythological fate were ever to overtake me, and I were to be imprisoned in a tree, I should pray that it might be a *quercus*—rugged, venerable, and solitary, with shattered but defiant top, its whole figure angularly beautiful, a forest monarch, offspring of storm and sunshine, sylvan type of picturesque endurance,

> "Jove's own tree
> That holds the woods in awful sovereignty,"

and no less dominant amid the refinement of lawn and park, sternly majestic everywhere.

Its longevity befits the toughness of its fibre and unconquerable vigor:

> "He has stood for a thousand years,
> Has stood and frown'd
> On the trees around,
> Like a king among his peers."

The oak's vigor is well illustrated by Robert Douglas where he says, "The acorn is the only seed I can think of which is left by nature to take care of itself. It matures without protection, falls heavily and helplessly to the ground to be eaten and trodden on by animals, yet the few which escape and those which are trodden under are well able to compete in the race for life. While the elm and maple seeds are drying up on the surface, hickories and walnuts waiting to be cracked, the acorn is at work with its coat off. It drives its tap root into the earth in spite of grass and brush and litter. No matter if it is so shaded by forest trees that the sun cannot penetrate, it will manage to make a short stem and a few

leaves the first season, enough to keep life in the root, which will drill deeper and deeper. When age or accident removes the tree which has overshadowed it, then it will assert itself. Fires may run over the land, destroying almost everything else; the oak will be killed to the ground; but it will throw up a new shoot the next spring." What indomitable will! Those who accept the Darwinian theory will have no difficulty, in the case of some men, in finding the oak in their direct line of ancestry.

No other genus of trees shows such varieties of leaf-type as are found in the numerous species of oak; yet bring together a leaf from each from all over the world, and there is something in every one that plainly asserts its common origin.

Out of eight or ten common species, the white oak is probably the most satisfactory for cultivation for its very healthy foliage, which is more free from insect attack than any other; yet the pin oak (*Quercus palustris*) is sometimes as thrifty and of handsomer foliage; the red and scarlet oaks are also more showy, with large glossy leaves, and the swamp white (*Quercus bicolor*) rivals them all with a leaf that is both leathery and lustrous. The post oak (*Q. minor*) is less pretentious in size, but its glossy, thick and almost evergreen leaf is one of the handsomest in the family. In our third excursion we shall encounter the most imposing oak specimen in the park—a mossy-cup-oak (*Q. macrocarpa*). What magnificence of color in October from all the various sorts, robing the forests in such deep rich tones as send a thrill through all the landscape; here is the oak-fibre

again, become luminous. It is the white oak above all others that clings to its withered foliage, a mournful instrument for winter winds to play upon. The pin oak is the easiest to recognize in winter by its drooping lower branches that often sweep the ground. Culture cannot spoil the oak spirit; there is a refreshing barbarism in all the species that gives a wholesome, stirring tone to scenery, much like the wild resonance of kettle-drum and trombone to invigorate the mellifluous flute and oboe and ethereal strings in a human orchestra.

Three unusual oaks in the Park should have special mention. A singular variety is the cut-leaved (*Quercus robur asplenifolia*) from abroad, an interesting curiosity. Our native willow oak (*Q. phellos*), with a shining, leathery leaf, almost a fac-simile in shape of a willow leaf, is a beautiful tree, which, despite the willow type, is very *oakish*, and one of the handsomest is the Turkey oak (*Q. cerris*), of Southern Europe, with especially effective foliage, and extremely dark, deeply furrowed bark, found clustered and singly in several places.

Willows.—One of the most easily recognized types of growth is found in willows. Generically so distinctive, they are, however, the hardest of all to resolve into species, offering quite as much difficulty to the botanist as sparrows do to the ornithologist. Four kinds—weeping, yellow, shining, and (in early spring) pussy willows—are readily distinguishable, and their landscape effect is individual; but of nearly all the rest the differences are so minute as to be of little interest except to the expert. Even scientists are not agreed, and what one

calls a distinct species another thinks only a variety, the whole genus well exemplifying the truth that variety and species differ only in degree, not in kind. Without wishing to discourage research into the microscopic diversities of those closely related forms, indicating a comparatively recent common origin, it must be said that for anyone whose aim is the enjoyment of nature in its broader outlook, it is not worth while to investigate the minutiæ of willow-variation, since the number of experienced botanists is small who have grappled thoroughly with the subject.

Our native willows are all shrubs or very low trees; the arboreal sorts are foreign and to a small degree naturalized. These latter are of great service in lawn-culture, as presenting a noble and exceedingly graceful arboreal figure, without the heaviness of dense and deep green foliage, thus having the charm of water-color rather than of oil-painting. In any water-scene, along a brook, or on the margin of a lake, nothing blends more exquisitely than such willowy, translucent figures, relieving the eye from the solid tones of the more vigorous and masculine trees by infusion of an ethereal and feminine atmosphere. It were easy to imagine some of those elegant and airy forms to be the embodiment of old-time nymphs, in punishment or reward finding their eternal future at the water's brink.

The yellow willow (*Salix alba var. vitellina*) is justly a favorite. Long before a single bud has swelled, even in midwinter, it throws out the first signal of spring in the golden-tinted bark of its bare branches, deepening in color till the burnished mass of lithe twigs, in a clus-

ter of full-grown trees, presents, in full sunlight, such a splendid spectacle as is unsurpassed by all the scenes of spring. The shining willow (*Salix lucida*), whose broader leaf, glossy and deep green, has less of the willow character, is admirable for strong color where the scenery needs the emphasis of a small but conspicuous tree. Mention is made elsewhere of the weeping willow, to which stern science, with an unwonted sentiment of poetry, has aptly given the specific name of *Babylonica*.

Bald Cypress.—Like tall sentinels stationed here and there through the Park stand the bald cypresses (*Taxodium distichum*), the most columnar trees in the grounds save the Lombardy poplar. This is a deciduous conifer; which means that, though having cones like evergreens, its foliage is shed each fall—evidently one of the links (*not* missing) that bridge the broad interval between such diverse forms as the maple and the spruce.

With the impassive air of evergreens, the cypresses have a half-mournful look that the eye cannot long dwell upon with pleasure. They are cold and statuesque, but the world needs some of them, though not many, for their type strongly contrasts with everything around them, and an observant eye will pause to note their singularity. In full foliage they are richly but delicately draped in green, but are most peculiar in late spring when the closely crowded buds are just opening, and a fine continuous ruff of light green runs along the upper edge of every limb, strongly emphasized by the almost black bark; the effect is a little like that of the budding larch, but more striking. Nature had a divided mind

in regard to its leaf-structure; whether to make it a series of simple, minute, narrow leaves strung along the sides of the newly growing thread-like branch, or to consider it a genuine pinnate leaf, as in the honey-locust, she was plainly in doubt: and so are we; for many of the long leaf-stems (or branches) are dropped in fall, and some are retained. Are we here looking upon the very process of evolution in the ascent from the simple to the compound leaf? Better to think this, probably, than to suppose it a case of nature's being in a quandary.

The cypress is native to the Southern States, and yields valuable timber for house-finishings, etc. Like alders and all natures of good taste it lingers by the water's edge, and possibly finds pleasure in seeing its tall form ever imaged in the mirror.

Hornbeam.—One of our smallest trees, often a shrub, is the hornbeam, or ironwood (*Carpinus americana*). With a fine appreciation of the special affinities of vegetable growth everywhere apparent, the landscape-gardener has given to the water-loving hornbeam its favorite place upon the shore of pond and lake. When trained into symmetry it is a comparative failure, but in a semi-straggling habit it is singularly effective, as may be seen on the east side of the "Pond." The leaf is quite elm-like in appearance, and the peculiarly flat sprays show many tiny leaves intermingled, an effect seldom seen except in the hornbeam and an allied species. The bark is a more ready index of the tree than in almost any other species—dark ash, smooth as a beech, and with strange

longitudinal ridges and furrows. Its ally, the hop-hornbeam, identical in leaf, is as unlike as possible in the bark, which much resembles that of the white oak. In the short fruiting season a full-laden hop-hornbeam is extremely pretty with its abundant white or pinkish clusters of hop-like fruit, but as a cultivated tree it is by no means as popular as the hornbeam, and there are but very few in the Park.

Ailanthus.—Among our *impressive* trees must certainly be named the ailanthus, of such proportions when full-grown that it may well be the sole occupant of an entire acre of greensward, and far too massive for limited lawns. Its two defects are its late vernation in spring and its large-limbed, scrawny appearance in winter, when it presents a mass of coarse, ungainly branches, necessarily incident to its type of long and heavy compound leaves. But amid the lifeless, ragged appearance of foliage in general that betokens the approach of fall, this tree is remarkable for its special liveliness and freshness of color, one of the most notable effects in the Park at that season. On the other hand, it is the last of our common trees to show signs of life in spring. Far into May one might think it quite dead amid its full-foliaged surroundings. But finally its large buds swell, developing into a yellowish-green pinnate leaf that soon attains a length of from two to three feet, with thirty to forty leaflets, each quite as large as a beech leaf. Soon the color deepens, and in September, with its luxuriant and immense dark-green foliage spreading majestically on every side,

it challenges admiration beyond almost any other growth.

The ailanthus is what botanists call dicœcious; *i.e.*, its stamen-bearing flowers grow on one tree, and the pistil-bearing on another. The staminate blossoms emit a very disagreeable odor in June, which caused a reaction from its popularity when first introduced into the country. But pistillate trees are now being exclusively planted, and for certain situations nothing could be more desirable; and with large room a stately ailanthus becomes the focal point of a broad landscape.

Beech.—One of our staple decorative trees is the beech, a forest ornament, but much more beautiful when, in ample space, with light and air on every side, it can realize its type as a broad and shapely growth of elegant form, with handsome bark and well-fashioned leaf. An atmosphere of serenity always envelops a beech; we as instinctively associate it with sunshine as the oak with storm. Its noble trunk and bark of fine texture, with shelving sprays of full foliage, betray a different temperament from that of any other forest tree. No tempests ever invade its spirit.

Our one native species will do credit to the most select surroundings, but it is the European beech that is commonly cultivated, having the slight advantage of more delicate leaves, and the important merit of coming into leaf earlier than our own by a couple of weeks. This fact, and its great abundance in the Park, make it the most conspicuous foreign species in spring. Nothing sets off the prevailing green more effectively than

the purple-leaved beech, a mere variety of the European form, said to have been discovered by a clergyman in a German forest. A cluster of four can be seen on the right after crossing the bridge. The dark color is deepest in spring and summer, but largely "burns off" by fall, when the green is but slightly tinged. The foreign beech is recognized by its smaller, rounder and scarcely serrate leaf. The base of the trunk is buttressed by spreading roots even in a small beech more than in any other tree.

European Alder.—Darkly rising from the water's margin—its congenial situation—both at the Pond and the Lake, is the alder, a gloomy but effective tree: not a native growth, but from Europe, for our own alders are only shrubs. It is ominous-looking in so sombre hue, and sure to attract attention either in winter with its branches thickly hung with black cone-like fruit, and blackish bark, or in summer, luxuriant in dusky foliage. The leaf is much like that of native alders—thickish, oval and sharply serrate—not a handsome type, yet one that masses up finely in suitable situations. In early spring the alder is conspicuous for its abundance of long, slender yellowish catkins. Although this is a primitive mode of inflorescence, it sometimes is strikingly effective, coming as it often does, especially in birches, alders and willows, before the leaves develop. Indeed, one will rarely see a more beautiful view of its kind than a white birch in early May, laden with slender yellow tassels, like a rain of gold; no ornate blossoms could be more pleasing, the effect being heightened by

the fine tracery of twigs, flushed with the green of the opening leaf-buds. The grace of such flowering is longer remembered than many a more pretentious bloom.

Elms.—There is no tree that holds a prouder position than does our favorite white elm, a distinctively American growth, whose figure is at once unique, graceful, and imposing. Elm and maple will always monopolize the function of shade-trees in this country; yet their types are so different that they can never be rivals. The elm is built on too large a scale to be desirable where maples are suitable. Its wide-spreading top must have ample room, and the breadth of the arch must be in better proportion to its height than is possible in streets of ordinary width. In its younger days it is manifestly inferior to a maple for shade purposes; but, like some people, it was created for a great occasion, and when after a century it has attained full amplitude, a venerable elm is the noblest type of graceful and courtly grandeur to be found in the arboreal kingdom. It is in the wide thoroughfares of old New England towns that it is seen in perfection, where every other growth, native or foreign, dwindles beside its towering, massive figure. You would ransack Europe and Asia in vain to find a tree that could fill the requirements of Central Park, where the Mall is superbly bordered by double rows of native elms.

An entirely different type is found in the famous English elm, of which the Park affords many fine examples. Lofty, of wide-spreading habit, and with some of the oak's angularity, it is worthy of its repute as one

of Europe's favorite trees. It lacks, however, the magnificent sweep of over-arching branches that makes an ancient white elm seem like a silent benison of the Almighty. Although called "English" elm, it is not a native of that country, but was introduced many centuries ago, and in its several varieties has spread over all Europe.

No arboreal blossoms are more insignificant than the elm's; but it needs no transient glory of bright color; noble form, commanding size, an extremely graceful leaf, and luxuriant foliage have given it an assured preeminence in elegance and dignity. Quite inferior as timber to oak and maple, its chief utility is ornament. One of the fleeting pleasures of spring is to note the first budding of the elm, as its tiny leaves expand and fringe more deeply, day by day, the lace-like filigree of minute twigs, until a filmy green spreads over all.

KŒLREUTERIA.—Probably the most ornate compound leaf in the Park belongs to a species from Japan, which, for want of any popular synonym must be introduced to the reader under the formidable scientific name of *Kœlreuteria paniculata*. Never a large tree, it is a charming adornment of small grounds, and its bloom, late in August, of showy panicled yellow flowers materially emphasizes its worth. Heavy foliage on large trees gives strong tones to a broad landscape; but such trees as this, with elegant leaf-configuration in light sprays, give to a limited area a pleasant shade without deep obscurity. It will be found on the south border of the walk, south

of the "Pond," not far from the cottonwoods. Color-tones of landscape are like tones of melody; an extensive view, like a grand aria, calls for the widest range of the gamut; a miniature scene, like a simple folk-song, is overwrought if it strikes the depths and heights.

Ash Trees.—A class of trees of no very special note is the Ashes (*Fraxinus*). Their names—red, white, green, blue, black—raise false hopes as to their beauty and distinctiveness. Collectively, I make bold to say, it is an indifferent group, scarcely worth cultivating for ornament, and inferior as timber. A prominent writer says of the white ash that it is "the most beautiful of all the American species." She is entirely mistaken, the *black* ash is a much prettier tree; its more numerous and stemless leaflets give a more slender, compact form to the leaf, which, moreover, is a dark, rich green, instead of the faded tint of the white ash. The black ash, in fact, is a rather dressy tree, and so is the blue; but the chief pleasure in finding a red or white ash is, that it adds another to one's list of discoveries. The whole group contributes little or nothing to the display of autumn coloring. The European species are not essentially different from our own. Ash and hickory having much similarity in foliage, it is well to have an easy means of distinguishing them. In the ash the leaves are always *opposite* on the stem, in the hickory they are always *alternate;* and the hickory leaflets are commonly larger and broader. The long-winged and abundant fruit of the ash accounts for its wide dissemination.

HORSE-CHESTNUT.—If the fabric of some foliage were not thick and heavy, we should not realize how light, airy, and translucent it sometimes is. The garments of the horse-chestnut, like rich silk, almost "stand alone," and if her figure were Venus-like—which it is far from being—she would be the envy of all her tree-neighbors. Throughout the summer what a refreshing coolness beneath those large, palmate, deep-green leaves; but the latter glory often exceeds the former, as in fall its mantle is sometimes dyed a golden bronze. Its whole form is too stiff, round-topped, and symmetrical to be strictly picturesque, yet a full-grown specimen is of commanding aspect, and it is so luxuriant and vigorous as to have become one of our most familiar trees, although not indigenous, but an importation from China. Its compact, numerous pyramids of white flowers are of a piece with its general stiffness, but like erect torches they illuminate the dark background in a striking fashion.

Our native allied species, the Ohio buckeye, has but five leaflets and pale yellow flowers. Another sort, probably a hybrid of the Chinese and a native, with five to seven leaflets, has rose-red petals, and is quite pretty, and a still finer one (*Æsculus Pavia*), of American origin, whose entire flower is red, is found in cultivation in the Northeastern States.

POPLARS.—How unobtrusively yet forcibly trees image human temperaments and conditions! Some are born to command, others are menial; and one of the lordly sort certainly is the cottonwood or river poplar,

three or four of which on the south bank of the "Pond" form one of the most impressive views in the Park, and there are no trees throughout the grounds more likely to attract the attention of a passer-by. Another cluster is on the "West Drive," near the soldiers' monument. Better than mere size is their picturesque appearance. It is as restful to watch those giant forms as to pause by a babbling brook, for a breath of air puts the million leaves a-quivering, and a moderate breeze instantly fills them with a wild thrill of tumultuous silence. Though such massive figures demand a long vista, younger growths are in much favor for the lawn; and their rapid development, vigorous, glossy foliage, and not too spreading form have induced their planting along many of the streets in New York City.

In leaf-type, quivering foliage—effected by a *flattened* instead of the usual *round* leaf-stem, by which it is so weakened that the leaf is easily twisted by the wind—and appearance of bark, our two aspens, common and large-toothed, show themselves allied to the poplars. With no objectionable aspects they are not sufficiently admired for cultivation, the poor little common aspen being hardly represented in the Park, and with not a single specimen of the "large-toothed" (*grandidenta*); so that one finds them mostly in thin woods and along the roadside, spruce little trees, that leave you asking whether favor, as in the human kind, does not go by luck as much as by merit. Their smooth yellowish-gray bark is characteristic, and much prettier than that of most small trees, and the "large-toothed" presents a singular appearance in early spring, when its small

leaves are so covered with a white cottony substance as to give, at a distance, the effect of full bloom; but the common aspen leaf is not thus blanketed in infancy.

The Lombardy poplar is the most columnar—fastigiate, as botanists call it—of all our trees. Several small ones are near the "Pond," but a fine cluster of full-grown ones may be seen at the extreme northern end of the Park near the east wall. It is a tree that requires good judgment in planting, as its singularly slender form does not blend with all surroundings. It is a favorite tree for country roads in some parts of Europe, but why I could never comprehend, as its capability for shade is almost *nil*.

Balsam poplar and balm of Gilead are two less familiar members of the family; and it is interesting to note, in this as in similar instances, the resemblances that betray kinship, sometimes plainly, often so subtly as almost to defy description. Indeed, the comparison and contrast of allied forms is one of the most important sources of pleasure in plant study, and increases our wonder at the profound scheme of creation that has clothed the earth with such bewildering diversity of beauty, yet all its forms, in tones fainter or louder, ever proclaiming their relationship and common origin.

Just as this earth is the theatre of man's evolution and attainment of ideals, is it not equally true that, along lower lines, other ideals in vegetable and animal life have been constantly aimed at through the long ascent from the original protoplasm? In recognizing this earth as a vast moral and intellectual theatre, we must not forget that it has been, through millions of years,

and is now, a stupendous botanical and zoological theatre of development as well, which adds immensely to the dignity and significance of the long and mysterious career of our globe.

One trait of the poplar family, seen in varying degree in all its species, is a slender, tapering form not quite like that of any other group. The Lombardy poplar carries it to the extreme, but we find it in cottonwood and aspen in a modified way. Far as the eye can see a balsam poplar this special feature is recognizable. The whole group is like a family of children having a common peculiarity of figure. The bark, too, is tell-tale, and the smooth, leathery leaf. How marvellous that somewhere in the tiny seed of each of these species is wrapped an indestructible potency that moulds the seedling, sapling, and the ever-growing tree into rigid conformity to the *poplar idea*, yet with such liberty of variation as makes not only the species to differ, but every tree different from every other in the same species. In that microscopic embryo resides the formative principle of the plant's whole career, be it of sequoia that lives a thousand years, or of the cypress vine that dies in six months, laying strong hand on every branch, guiding each twig, determining the unfolding of leaf, the fashion of flower and fruit, and appointing its stature; even its sentence of death is somewhere written in the tiny germ. We look with wonder and awe upon some of the mighty developments of plant life; we may well bend in reverence before that tiny miracle of nature, a seed.

Of all the poplars the most picturesque is certainly

the "silver-leaf" (*Populus alba*), which betrays as much of a poetic temperament as is possible to be expressed in the arboreal type of growth. It breaks away from the poplar characteristics of slenderness, and presents a portly breadth that is at once dignified and graceful. One must have a year's experience of a tree to know its most inviting aspect. In this poplar it seems to be in the early budding period; the dark and deeply furrowed bark of the lower trunk is then seen merging into the peculiarly mottled white of the summit and of the spreading branches, and the entire pose of its striking figure pleases the eye as it stands projected against the sky, softened only by a wealth of slender pendent catkins. The Park contains several notable specimens of it, particularly one just north of the large reservoir. It is hardly less beautiful in foliage, for the small and finely shaped leaf, with something of the contour of the ivy, is of a rich green above and silky white beneath. Its popularity has been lessened by its propensity to spread by suckers from the root—a very lazy objection to the cultivation of such a beautiful figure. Introduced long ago from Europe it is now quite acclimated. No class of trees is oftener referred to in ancient poetry than the poplars, and it is this "silver-leaf" species that is particularized.

Chestnut.—Chestnut, oak, and hickory show the savage side of vegetation, for which we all have some affinity, as we have for lions and tigers. Such trees can never be tamed to gentleness, they scorn refinement. But a huge chestnut, given a wide clear space, shows a

sort of brutal grandeur that is without competitor in all our sylva. It is one of the few lordly trees; heroic, a sort of epic poem. Examined in detail there may be much to criticise, but it is cast on broad lines and refuses to be judged piecemeal; in its entirety it is irresistible. What a tremendous girth of trunk, what huge branches flung on every side, each fit to be a sizable bole; how it scorns the thought of being graceful; every leaf wears a repellent air in its long rows of sharp teeth; its burs are untouchable; it is a ponderous mass of grim unsociability; you may admire supremely, but you could hardly love a rugged old chestnut.

But in June it takes a different fancy, and a cloud of misty white envelops it—it is majestically in bloom, and for miles around it is the towering centre of attraction; its millions of tiny blossoms conspire to produce one of the most stupendous floral displays of nature. How gracefully those slender, cream-white catkins hang by thousands from every point of attachment—it is the feat of forestry! The man who is not impressed in an unusual way by a magnificent chestnut in its June glory —the grand *finale* of our amentaceous bloom—must be almost incapable of being touched by any of the beauties of nature.

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THE POINT

ON "THE POINT" — SECOND EXCURSION

"The knottie maples, pallid birch, hawthornes,
The horn-bound tree that to be cloven scornes,
The dyer's shumach, with more trees there be,
That are both good to use and rare to see."

—William Wood.

STANDING on the grand stairway at the north end of the Mall, and looking northeastward across the esplanade, one sees a narrow strip of land projecting into the water, which is commonly called "The Point." Leaving the fountain on the left, passing the group of magnolias, the austere cedar of Lebanon, and the boat-house with its numerous pleasure-fleet, and turning to the left, we reach the little tongue of land jutting into the Lake. No spot of the same area in the Park is so stocked with interesting trees; for in a length of scarcely two hundred feet one may find twenty-three species, single and clustered, viz.: sassafras, flowering dogwood, wild black cherry, yellow locust, black haw, swamp white oak, nettle-tree, white elm, mocker-nut hickory, white birch, paper birch, cockspur thorn, European bird-cherry, scarlet oak, hornbeam, European yew, Norway spruce, smoke-tree, hemlock, alder, aspen, pin oak.

SASSAFRAS.—Our most aromatic tree, in root, leaf and bark, is the sassafras, with also a spicy odor in the flower. The blossom comes before the leaf, and a large tree in full bloom is a golden ornament of April; very conspicuous, too, for the deep yellow clusters have almost the monopoly of color, standing out boldly against the bare forms of the woodland. The foliage has no special recommendation except that best of all blessings, healthfulness. One soon learns to recognize the tree from its deeply furrowed, yellow-tinted bark, which is rougher, even in a small tree, than in other trunks three times its age and size.

The sassafras is not as important a plant as when its medicinal virtues were in high esteem, but none the less interesting to the botanist. For ornament it is not a tree to choose; too good wantonly to uproot, but hardly worth deliberate planting, at least in such large numbers as one finds in the Park. It spreads rapidly by shoots from the root, so that a full-grown tree is apt to be surrounded by a flourishing brood of saplings. The fruit is berry-like and dark blue, on reddish stems, and eagerly sought by the birds. The most noticeable characteristic is the variant form of leaf, the mulberry-leaf being the only other one that is like it in this respect; for while the majority of its leaves are "entire," some are two-lobed, others three-lobed, and all the different shapes are often growing on the same twig. The foreign mulberry shows an even greater variation on the same plant.

The "entire" form of leaf, *i.e.*, with a smooth edge, always gives a colorless character to foliage. This is

one secret of the attractiveness of maple, elm, beech, and oak, as compared with catalpa, persimmon, osage orange, sour gum, and sassafras. Magnolias and rhododendrons have entire leaves also, but the effect is somewhat offset by their rich green and heavy texture. There are comparatively few species of plants to whose leaves Nature has not taken the pains to give the finish of a fringed edge. Let one examine a dozen leaves of different species in this one respect alone, and it will be a revelation of nature's skill in ornamentation before unrealized. In my opinion, the peculiar serrate edge in the elm is the most elegant of any native tree.

Locusts.—Of native ornamental trees none are more generally cultivated and distinctive in their whole atmosphere than the locusts, a pleasing text for any tree-lover to dilate upon. Two of them being brothers (botanically), and the third a first cousin, we had best consider them together, the better to note their points of contrast, although only the common locust is found upon "The Point."

As regards foliage, by far the finest is the honey-locust, which is indeed unequalled among all our trees for its exquisite feathery verdure, resulting from the minute dissection of its decompound leaf, forming the most airy sprays of foliage imaginable, emphasized by the often imposing altitude, and an extremely dark-colored bark —a most striking union of virility and grace. Compare it for a moment with any other pinnate-leaved tree, like the butternut or ash, and its extreme delicacy is at once evident. It is in the middle of May that the mul-

titudinous, half-developed leaves bursting forth from a large honey-locust can only be compared to a fleecy emerald cloud enshrouding the massive black trunk and branches; nothing in our vegetation rivals it, except the wondrous misty green of the tamarix in fall, the most strikingly beautiful shrub, as regards foliage, that the Park contains.

In a tree of such temper one is surprised to find the trunk horrent with dense clusters of formidable spines, each spine a poignant condensation of an entire branch into a rigid needle, the spines themselves branching into other spines, and covering large portions of the trunk, in some cases, with their horrid masses—and for what earthly purpose? At least it is an interesting parable of good and evil mixed in the same nature.

Having been so lavish in foliage-beauty, nature wisely withheld the crowning charm of handsome inflorescence, lest the honey-locust "should be exalted above measure"—possibly we have here the meaning of the spines, they are "thorns in the flesh"! One scarcely knows when it is in blossom, it is such an insignificant matter, but the minute flowers ripen nto portentous pods eight to ten inches long, and an inch wide, yellowish-green as they dangle from the boughs in September, but soon blackening and clinging through the winter, till they fall, twisted and unsightly, strewing the ground. The color of bark and pod gives the name of black locust, and "honey" locust comes from the yellow pulp in the pod. The Park contains several fine clusters of this species, the largest being east of the "West Drive," near the Seventy-second Street entrance.

With a pinnate leaf of larger leaflets than in the foregoing, the common locust mingles most gracefully with such simple-leaved trees as the linden, catalpa, and maple. But its finest feature is its long pendent racemes of fragrant white blossoms, filling the air with delicious perfume. A large cluster can be seen on "The Point," which well rewards a visit in blossoming time, the last of May. Odor is the vaguest charm in the world of sense, a sort of spiritual presence, on the very confines of matter, sometimes as subtle as a blush, and evanescent as a smile. But, vague as it is, no other sensations are so indelible in the memory, inseparably blending with experience sweet and bitter, so that the most casual whiff invokes a vision of events in years long fled.

A cluster of much larger locusts will be found at the extreme northwest end of the Park. This species has bark that is rough and much lighter colored than the preceding. The bark is prickly, especially on the younger growth, but in the honey-locust it is thorny; the difference is radical. Prickles, however large, are an outgrowth of the bark; peel off the bark and the prickles go with it; thorns or spines are metamorphosed branches, and proceed from the wood beneath the bark, and are rigidly attached. The pods of the common locust also hang all winter, but are neither so long nor black, as in the honey-locust.

"All good things go in threes," says the proverb, and the author may have had locusts in mind when he said it: for quite as ornamental in its way is the third member of the trio, the clammy locust (*Robinia viscosa*), which is one of the unfortunate omissions of the Park

which seems unaccountable. This is a smaller tree than either of the others, often found in blossom as a shrub, and less familiar than the other two, being found wild only in the southern part of our territory, but considerably cultivated at the North. Its foliage effect is almost precisely that of the common locust, though sharp eyes will detect the mucronate or finely pointed apex of each leaflet. The two important distinctive features are the stickiness of leaf-stem and branchlets, more marked than in the butternut, and its dense and abundant masses of pink-white or rose-colored flowers—pea-shaped, as in the allied species—with a most delicate aroma, and far handsomer than those of the acacia. Another advantage is its later and more prolonged flowering; for its first bloom is not until about the first of July, and this is followed a month later by another, more restricted, yet quite showy. This beautiful growth, shapely and perfectly hardy, deserves much wider popularity. Its late flowering particularly commends it, and it is unequalled by any other native tree—scarcely by any foreign—in the size, prodigality, and rich tint of its flower-clusters. This, too, is often thorny, like its kindred.

Hickories.—It is a transition that has the merit of strongest contrast to speak next of the hickory—tough, strong, and coarse-grained, without a particle of poetry in its nature, forgive me, ye that think the contrary—and may the writer pardon me who calls it "one of our most *picturesque* trees"! Next to the chestnut, it is our most rugged type of forest-growth, and its

pinnate leaves are of the largest and coarsest. As timber, the hickory renders the most menial, yet a most important, service, rising no higher in utilitarian art than the manufacture of farming implements and parts of carriages, and unsurpassed as fuel; whereas the oak, hardly less coarse-natured on the exterior, has so fine a grain as to be adequate for the choicest cabinet work.

Yet this very roughness—a sort of brutal masculinity—secures for the hickory a distinctive interest, something as Satan, in "Paradise Lost," has a "bad pre-eminence" that makes him the fascinating hero. We must certainly honor a tree whose brawn and muscle enable it to play so responsible a part in life's utilities. In its own sphere, although farthest from ornamental, it stands pre-eminent.

I feel a pity for some of our trees with rather colorless individualities; not strong-fibred enough to be downright serviceable, not refined enough to be ornamental—prosy characters, a sort of drone in the universal hive of industry. As the world is constituted, utility has the precedence of beauty, and the hickory is a good illustration of the providence that looks out for our lowest even more than for our highest needs. Enumerate the greatest blessings of life—health, food, sunlight, water, air—the lowest creatures possess them as much as we, they are the indispensables. And so the hickory, though it never veneers our furniture like the oak, does quite as much to keep the machinery of life in motion.

Most of the hickories—we have nine of them in America, and no other continent has any—are distinguishable from each other in foliage by rather small differences,

which will be found stated in the detailed descriptions. The bark has a peculiarly tough and obstinate look in all of them, and the fruits are quite diverse. Of hickory-nuts only the "shagbark" and the pecan-nut (a hickory growing in Illinois and southward) have commercial value. It will gild the edge of this somewhat unflattering account to say that the hickory contributes a very distinctive tone to autumn coloring. The rusty yellow that first replaces the green soon deepens to a rich golden brown, by which the full-foliaged pyramidal mass becomes a notable object in an October landscape.

Black Haw.—Of all low trees and shrubs in woods and lanes the most conspicuous for abundant bloom in the middle of May, as the dogwood fades, is the black haw or stag-bush, one of the most valuable of native growths for planting broadcast, and very desirable for the particular season when in flower. It is cosmopolitan, thriving anywhere, and its mass of pure white makes it for the nonce the rival of the apple-tree, and the later-blooming thorn. True, it is not exactly a "cultured" plant; it lacks the indefinable something that makes so many of our shrubs decorative when past the blooming period. Its small leaf, in form and texture, is scarcely dressy enough to compete with the choicer kinds. But it is such a royal blossomer that in its palmy days of May it is a very effective species for the lawn, and much of the beauty of Central Park at that season is due to the abundant planting of this small variety. After its gala-day of flowering—which, by the way, is of good length—it is fairly crowded out of mind by the other

forms of inflorescence that come so thick and fast. But in early fall the eye reverts to it again; its whiteness has turned to abundant blue-black berry-clusters, and the deep reddish-brown or bronze tint of foliage is exclusively its own.

NETTLE-TREE.—An evident favorite of those who stocked the Park (for it is profusely scattered throughout the grounds) is the nettle-tree, also called hackberry and sugarberry. East of Ohio it is rarely found except in cultivation, as its habitat is chiefly the Middle and Western States. Its leaf is small, rather triangular, and decidedly lop-sided, as the linden is to some extent. It is said to resemble the elm-leaf closely, but the difference, to a fairly good eye, is greater than the resemblance. Why it is made so much of in the Park I cannot discover, unless they secured a "job lot" at a bargain. I have tried hard to get interested in this species, with but poor success. It is one of the easiest to recognize in winter, as its branches are often filled with large clusters of coarse dead fibre, the withered stems of the fascicled staminate flowers; and its smooth, beech-like bark is covered toward the base with blistered excrescences not found in any other tree. It has no blossoms worth mentioning, its dark berry-like fruit is not so abundant as to be attractive, and the foliage withers without a particle of color in fall. This is the faintest praise with which I can bless this species.

WILD BLACK CHERRY.—But a good, honest ornament of our woods, and which bears itself most creditably in

the more elegant surroundings of a lawn stocked with foreign growth, is the familiar wild black cherry. We are often surprised that it can make so brave a show in polite society. It cannot fill a niche in a corner, like the black haw, for it is commonly a sizable, sometimes an imposing tree, a few in the Park being of such magnitude as to make their blossoming a striking spectacle. One of the finest is just north of the "Reading-room," at the northwest corner of the "Ramble." While the black haw banks up well against other growths, affording a fringe of white to overlay the various greens, a wild cherry demands a spot where it can monopolize the view, a towering snowy mass upon the greensward. It is not accounted one of the choicer species, for it has the forest-flavor; but a rugged, freely growing sort, that for a large lawn is as satisfying as many that are more pretentious. It does not pass from view after flowering, for its shapely leaf grows more leathery and glossy as autumn approaches, its fruit hangs thick in August, to the great delight of the birds—and the deep crimson of its October coloring is a conspicuous feature in the landscape. Moreover, it has a picturesque figure as it grows larger. The bark is singularly rough and ragged, apparently indicating an unhealthy tree; doubtless a false inference, as in every other respect it is perfectly thrifty. The spicy fruit is not unpalatable, and is still more agreeable in its fermented state to those addicted to "rum cherry."

The European bird-cherry, standing at the extremity of the Point, is quite as prodigal of its long racemes as the black cherry, and surprises one with its beauty at

the instant of full bloom with its countless sweeping tassels of white, but in foliage it is inferior, and it lacks the picturesque atmosphere of its relative.

Birches.—The birch family belongs to what in European society would be called the "upper middle class," and a patent of nobility, more deserved than in many such conferments, has been granted to one member of it, the cut-leaved weeping white birch. All the species—black, yellow, red, paper, and white—deserve favorable mention, and the beauty of their forest-growth is often transferred to adorn the lawn, all being found in the Park.

The black or sweet birch is most widely known, many people's acquaintance with it being, indeed, more intimate than they think, for it is the oil extracted from its bark that gives the "wintergreen" flavor of a well-known tooth-powder. This shares with the yellow birch the peculiarity of having its leaves mostly in *pairs*, giving unusual effect to a spray of foliage. The most obvious difference of these two species is the yellowish, silvery-gray bark of the latter, that exfoliates in very thin layers whose ends are curled up, while the dark-brown bark of the sweet birch shows only a trace of exfoliation. In some yellow birches the trunk is as beautiful as it is unusual; the bark is less aromatic than in the black birch. The river birch, with its branches slender and drooping, furnishes material for "birch brooms."

The most ornamental are the "paper" and the white birch; the former, with broader, almost roundish, leaf,

is the more northerly, where it strongly punctuates the forests with its bole of chalky white; it is of larger growth than the white birch, which is the pride of the family, with its languid elegance of form and careless grace,

"The Lady of the forest,"

as Tennyson calls it, and at all times beautiful. In winter, when its tangled mass of fine twigs fashion lace-like designs upon the sky; in spring, when thickly hung with long, bright yellow aments; and in summer, when its tapering, lustrous leaves array the tree in foliage almost as light as gossamer—in each successive season one finds new pleasure in this slight figure that in exquisite refinement rivals all other native growth. It lacks the vigor and positiveness of many other trees, yet I believe that if all the white birches were eliminated from the Park, it would mar the scenery more than the loss of any other one species. Nature has certainly realized one of her ideals in the weeping cut-leaved birch, that sways in every lightest breeze, a fountain of green spray. Several fine examples can be seen a little beyond the northwest corner of the "Ramble."

THORN-TREES.—No family of small trees fills so large a place in landscape-gardening, through the combined merits of fine foliage, notable bloom, and attractive winter-ornamentation, as our thorn-trees, comprising the cockspur, white, black, evergreen, and the famous English hawthorn which is now beginning to be naturalized. They are all of low growth, often shrubby, filling a niche far too small for cottonwood, linden, or locust,

yet requiring something more positive than mere shrubs. The thorns that grow freely on the branches, though long, are no disfigurement, the tree's form is comely, the leaf bright and healthy and clearly individualized in the several species, the luxuriant bloom is one of the attractions even of the month of flowers, and, as summer wanes, the prodigal clusters of scarlet berries begin to show themselves, gleaming through the russet autumn leaves, a shower of ruddy drops against a winter's sky, rivalling the mountain-ash and holly. The whole annual career of a thorn-tree is a case of patient continuance in well-doing, and it does not lose its reward in the world's wide approbation.

The middle of "The Point" becomes, early in June, a broad sheet of white, which shows to best advantage from the boat-house and the grand stairway of the Terrace, for here in one solid group are twenty-three cockspur thorns, one more, to make a round two dozen, standing off by itself. But the paragon of thorns is the red-flowered variety of the English hawthorn, which is superb enough to warrant my giving its name in all its pretentious fulness—*Cratægus oxyacantha flore plena rosea.* Among all the beauties scattered so profusely throughout the Park, four will always recur to my mind as perfectly unique—the gorgeous full bloom of the yulan in the last of April, the pink-robed double-flowered English hawthorn in June, the weeping willows in early spring, and in fall the exquisite tamarix, that marvel of green mist low-lying on the ground, the most vaporous exhalation of verdure to be seen in northern latitudes.

One instantly knows the cockspur thorn by its peculiar leaf—polished and thick, rounded at top and with a long-tapering base; none other is more deluged in bloom, but the black and scarlet perhaps show a greater profusion of fruit. The cockspur is the one most used for hedges, though now being displaced by the thorny osage orange. In planting thorns it is well to choose a variety, as they differ in their flowering periods, the cockspur being the latest, as the scarlet is about the earliest.

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THE LAKE

The arrow shows the starting-point and the direction of the route.

ALONG THE LAKESIDE— THIRD EXCURSION

"The glossy holly loved the park,
The yew-tree lent its shadow dark,
And many an old oak, worn and bare,
With all its shiver'd boughs, was there."
—Sir Walter Scott.

CAN a lazy person, averse to long rambles, discover a pleasant path of ten minutes' length, along which he can find, mostly within touch, *fifty* ornamental tree-species, native and foreign, singly and in clusters, picturesquely grouped, illustrating every prominent type of form, foliage, and fruit in the growth of sylva, at home and abroad? Yes, the landscape-gardener of the Park has provided just such an opportunity along the west side of the Lake, and this is the route of our present excursion. The following list is the briefest possible account of what is brought into view successively by beginning at the south end of the "Bow-Bridge," and following the path around the west side till one reaches the little bridge at the north end of the Lake. The distance is covered in less than ten minutes.

Weeping Beech
Mossy-cup Oak
Swamp Magnolia
Weeping Willow
Sophora Japonica
Angelica-tree

Wild Black Cherry
Norway Maple
Sassafras
Cut-leaved Beech
Red Maple
Silver-bell-tree
Ailanthus
Shagbark Hickory
Alder
Ginkgo
Paulownia
Osage Orange
Black Thorn
Cockspur Thorn
Bald Cypress
Nettle-tree
Catalpa
Elm
Black Birch
Flowering Dogwood
Sweet Gum
White Birch
White Oak
Hop-tree
Fringe-tree
Common Locust
White Ash
Kœlreuteria
Hornbeam
Honey-locust
Linden
Cottonwood
Umbrella-tree
Purple Magnolia
Tulip-tree
Buttonwood
Turkey Oak
Weeping Birch
Shadbush
Scarlet Thorn
Slippery Elm
Arborvitæ
Hemlock

Weeping and Cut-leaved Trees.—An exceedingly graceful novelty of recent horticulture is the "weeping" tree, in most cases effected by grafting pendulous branches upon an erect trunk. The commonest illustration of this artful treatment of nature is found in the weeping birch and weeping beech, two specimens of the latter flanking the southern approach to the "Bow-Bridge." A really superb instance of the same will be found on the north side of the "Ramble," where three tall weeping beeches are so closely clustered as to produce one of the finest and most novel effects in green to be found in the entire Park. It is in an open space

about four hundred feet southeast of the Belvedere. Pendulous varieties of the maple, mulberry, mountain-ash, and elm are also cultivated, and all being of small size are serviceable for the smallest lawns. Perhaps the best as regards curious foliage is the weeping Russian mulberry (*Morus tartarica pendula*), whose leaf is one of the most ornate among trees. A few of these and of the weeping ash and elm would do more to diversify the Park than any number of European varieties whose differences are purely microscopic.

Nature has also been coaxed into that extremely dissected form of foliage known as the cut-leaved, beautiful examples of which in Japanese purple-leaved maple, sumach, oak, and white birch are in the Park. Though botanically only "varieties," they are of far more pronounced effect than many of the distinct species, and are one of the most important innovations in landscape gardening that modern times have produced. Another quite as important is the purple-leaved foliage, with which the Park is well supplied ; if one will look over the wall in the vicinity of East Seventy-second Street —the best spot in the Park for studying purple and cut-leaved foliage—he will find admirable examples of purple or rose-purple leaves in white birch, Japanese and sycamore maples and beech, all within a hundred feet of each other. Some of the purple beeches in these grounds are simply magnificent. The Japanese plum, also in the Park, is becoming popular as a purple-leaved dwarf tree.

Mossy-cup Oak. — Near the weeping beeches at "Bow-Bridge," across the path, one must note the fine

mossy-cup oak (*Quercus macrocarpa*), one of the finest oaks in the Park—broad, luxuriant, and majestic. The leaf, in contour, lustre, and leathery texture, resembles the swamp white oak's more than any other, but a critical eye will soon note that the lower half is very deeply lobed, and that the lobes of the upper half suddenly become very small; it is also a very large leaf, sometimes twelve or even fifteen inches long, exceeding every other in the genus. The "cup" is also peculiar in the fringe at its edge, which gives it the name of "mossy-cup"; and the acorn is sometimes of huge size, occasionally nearly two inches across. Its open and commanding position displays most admirably this splendid growth, and it is a pleasure to add that it is one of our "home products," being found in a large area of the country, and rated as one of the finest in North America.

Maples.—With nearly two hundred native hardy species to choose from, maples must possess very special merits that they should constitute more than nine-tenths, perhaps forty-nine-fiftieths, of all the trees planted along the streets in the Northeastern United States. The reason for this unanimity of choice is easily apparent. Many other species have one or another of the maple's excellences, but none other has them all.

First, it is very healthy and luxuriant in bark and foliage—the greatest desideratum of all. Secondly, it is not only symmetrical, but its form exactly adapts it to the requirements of street and sidewalk—tall and sizable, but not too broad; the equally symmetrical beech

is too wide-spreading for the situation. Again, the maple is a rapid grower; some trees would require twenty or thirty years to attain the size of a ten-year-old maple; this secures shade and ornament in the briefest period after planting. The fast-growing cottonwood, which has many of the maple's virtues, is also coming into popularity, as may be seen in the recent plantings of many New York streets. An important element in the effectiveness of the maple is the configuration of its leaf. This tree shows an endless gradation of greens, and a certain lightness of effect, even in the densest foliage, both resulting largely from the shape of the leaf. A street lined with the horse-chestnut, linden, or catalpa would present a very different and heavy appearance. The eye is pleased by the maple's beautiful blending of soft tones, its endless alternation of light and shade. But if the leaf were as small as in the white birch or the common aspen, the shade would not be thick enough. And lastly, the normal height of the maple prevents its overgrowth in streets of usual width; but in exceptionally broad avenues, as in old country towns, recourse must be had to the lofty, wide-spreading elm.

Besides our three native species—red or soft, sugar or rock, and white or silver-leaf—two from Europe, the Norway and sycamore maples, are now widely used in street and lawn. The leaf-type of these is much the same, but darker and larger, especially in the Norway. Neither is handsomer than a fine sugar maple, but the advantage of the foreign sorts—a peculiarity common, by the way, to most imported species—is, that they come into leaf about two weeks earlier, and retain their

leaves about two weeks longer than our native species—an important consideration from every point of view. The field maple (*Acer campestre*), of Europe, is made too much of in the Park, as it is a quite inferior species. Its leaf-type, as one can see by referring to the illustrations, is least ornamental of all maples.

Two other interesting native species, oftener shrubs than trees, with a northern and mountainous range, are the striped and mountain maples, with very distinctive leaves. Both blossom much later than the other sorts, and the abundant long clusters of bright red-winged fruit, hanging from the striped maple along a mountain-road in August, will catch the aimless eye of the most inattentive observer. This is the only species whose flower-cluster is *erect*, drooping only as the fruit ripens.

The box-elder, or ash-leaved maple, with a compound leaf, would never be admitted to the family, were it not for its doubly winged fruit, which is the indubitable proof of kinship; this is of more westerly range, but often planted eastward, where a small, quick-growing, graceful tree is desired. With identical fruit, but widely diverse foliage, there must be several "missing links"—possibly held fast in the rock strata—between the box-elder and all other maples.

This family fills a niche in nature and nature-art that could be supplied by no other tree-group, the world over. Its supreme glory, however, is in the transient period of autumn coloring, and here the native species are pre-eminent. The sour gum and dogwood may show quite as startling a scarlet, the tulip-tree and ginkgo as rich a yellow; but for lavish quantity of gorgeous

tint, and interminable blendings of rich shades, nothing approaches our plebeian red maple. It is the artist tree. In early spring it flings out a wealth of crimson flowers that is only prevented by our familiarity with it from being more highly prized. When the blossoms fade, the crimson dye runs back and suffuses the leaf-stems, whence later it spreads over the red-winged fruit, and at last the fire that has long smouldered breaks out into an October conflagration, that finally consumes the foliage to ashes. The sugar maple is often a mass of uniform light yellow, whose falling leaves strew the ground with a strange sunshine. But the white maple, whose deeply cut foliage gives it an especially "dressy" look through the summer, turns to a lifeless yellow, or simply withers.

Linden.—In marked contrast to maples are the lindens, that present an altogether different type of figure, leaf, and flower. Basswood and lime-tree are names of two of the species, the latter being a favorite in Europe, and figuring prominently in ancient poetry. Two or three hundred years is a great age for most trees, but there are authentic instances of the linden surviving nearly a thousand.

We have three native species, two with very large, and one with small leaves. With compact head and thickly branched, the large-leaved species produce remarkably dense foliage, with a contrasting effect, against elms, maples, and birches, that is fine; but the form and size of leaf preclude a graceful appearance. For small grounds, therefore, the common basswood is

not advisable, having the slight additional demerits of budding late in spring, and shedding its leaves quite early, littering the ground with their large withered forms. The small-leaved and the European species are more desirable, and they are scarcely distinguishable, the main difference being a very slight variation in the small flower, which will only be seen upon close inspection. The flowers are cream-white and quite pretty, but not very conspicuous, curiously attached to a long wing that flies away with the seed in the fulness of time. Their delightful fragrance lures the bees, and the honey-fame of Hybla resulted from the abundant lindens on its slopes.

CATALPA.—Catalpa is the Indian name of our most tropical-looking tree, with perhaps the exception of some of the magnolias. Chiefly a denizen of the South it is thoroughly hardy in the Northern States, and one of the most generally cultivated in park and lawn. It must be planted singly amid small-leaved trees, as its own immense leaf is clumsy when thickly massed; but a better foil for locust, elm, and white birch could not be imagined. With tropical laziness, it is one of the very last to show signs of life in spring, other trees being in full leaf and often past their flowering, before the catalpa bestirs itself; but its foliage is retained well into the fall, and its late flowering, in the last of June and in July, which is quite a brilliant affair, helps to lengthen out the inflorescent period of our trees. In our latitude its figure is commonly low, spreading, and exceedingly ungraceful. Like an ungainly individual most catalpas

throw their limbs about in a most awkward, sprawling fashion, and know nothing of grace and symmetry. Yet occasionally a less uncouth specimen towers upward in symmetrical dignity, much like the mountain-magnolia. Such a tree in full bloom is a revelation. Its bark is so distinctive as readily to identify the species, but it is not an interesting feature of the tree. In fall it hangs full of pods a foot long or more that remain all winter and give the plant the name of Indian bean. It is a thrifty species, easily cultivated both from slips and from seed, and the Park contains many specimens, especially the "Ramble" and southward.

Angelica-tree. — A real arboreal curiosity, that looks, more than anything else in the Park, as if made when nature was in one of her tantrums—if she ever gets into that undignified state—is a plant euphemistically called angelica-tree; but one finds its nature much better expressed in its two other more fitting names, Hercules' Club and Devil's Walking-stick, which state frankly and fairly the character of this savage little beast of vegetation.

Imagine a grim-looking stump ten to fifteen feet high and tapering gradually to the apex, scarcely branching except toward the top, beset throughout with long sharp spines, and from the summit throwing off in close succession a series of immense doubly or trebly compound leaves sometimes over three feet long and two or more in breadth, and one will understand the remarkable appearance of this strange growth. Stripped of its foliage, Hercules could not have asked for a better club, and for

a fiendish walking-stick it must be the devil's own choice. The linking of "angelica-tree" with such apt terms as these finds no rational explanation in science or poetry.

In the South it attains a height of forty to fifty feet, and its huge tuft of leaves spreading in all directions at the summit produces something of the appearance of a palm; but at the North it has only a scrubby, surly look of malignant deformity, ugly in summer, uglier in winter. The massive leaf-stem is stout enough to be a sizable branch, but the ultimate leaflets are scarcely three inches long. In July and August, towering above its palm-like elegance of foliage, rise long loose clusters of whitish blossoms, which ripen into black berry-like fruit that hangs long into the winter. In its autumn tints of yellow and red—the devil's sulphur and flames, to carry out the analogy—it shows to best advantage. A large cluster of these monstrosities are at the southwest corner of the Lake, at the water's edge, and two specimens are close to the walk which our companion-reader is now following.

Sophora Japonica.—Close by the angelica-tree is a Japanese importation but little known, the sophora, of erect, graceful form, and with pinnate leaves that are quite suggestive of the locust, but more tapering. Like so much of pinnate-leaved vegetation in tree, shrub, and herb, this is a leguminose species, which means that its type of flower and pod is that of the pea and bean. The association of these forms of leaves and flowers, and the frequency of yellow blossoms in this family are facts for which science as yet offers no explanation.

The sophora blossoms late in summer, bearing compound clusters or panicles of whitish flowers not particularly ornamental. An American species quite similar is found in the far west and south. In every prominent aspect it is as unlike the red-bud as possible, yet they stand almost side by side in botany, which illustrates how unlike are the points of view of the scientist and the mere nature-loving observer.

Buttonwood.—Widely distributed throughout the country is the buttonwood, a group of which, near the north end of our route, are among the more imposing trees of the Park, but in their wild growth in the Eastern States they cannot usually command much admiration. But there are buttonwoods and buttonwoods; a man may be handicapped by his environment as well as by his ancestry, and often only needs transplanting into surroundings that will bring out all there is in him, and surprise both himself and his friends. This has evidently been the happy lot of the Park buttonwoods—called sycamores in the West—and this particular cluster is one of the noblest there. It is in winter that their stately trunks, wide-reaching massive limbs, and smooth yellowish bark are brought into full relief, and emphasize the desirability of studying such growths in their bared forms as much as when nearly concealed by foliage. In most buttonwoods the thin bark flakes off in large irregular patches, much to the detriment of its good looks, but those referred to are unusually smooth.

As a rule, in woody plants the incipient bud of next year's growth may be distinctly seen in the angle

of leaf-stem and branch as early as May. In some trees, like the hickory, it becomes quite large by fall; but not a trace of it will you see in the buttonwood; but a little scrutiny shows the base of the leaf-stem quite swollen; detach it from the branch, and the end is found to be a hollow cup, and the new bud can now be seen on the branch neatly fitted to the cup, which all summer had completely enveloped it. This is a mystery; the careful protection of the bud through the winter we could understand; but in this case—and the same is true of the rarely seen "yellow-wood" and a few others—protection is given when it seems needless, and withdrawn just as it might be of service. Every operation of nature, however, has a motive, and this is what makes her endless variations of conduct so interesting.

Magnolias.—We have no group in which the family type is more distinctive and apparent than in magnolias; manifest in figure, bark, leaf, and flower, the brotherhood of the species is very striking. It is a hard family for the anti-evolutionist to deal with. Its sympathies are in the South-land, the most tropical of our growths; bravely bearing our Northern clime, its affinities are more with palms than pines. One species, the swamp magnolia, to the surprise of scientists, has been found as far north as Cape Ann, in Massachusetts, yet it is as rare as the mocking-bird in all other Northern States, and is practically a sub-tropical species like the others. Though called a tree, it looks more like an overgrown shrub in the incertitude of its trunk. Its dark green,

glossy, and thick leaf is much like that of the rubber-plant and rhododendron, but falls in November at the North. Its blossom is of exquisite texture, cream-white and odorous, two to three inches in diameter, the smallest of all magnolia flowers. It shows the family trait of few and coarse branches, with the foliage mostly clustered at the ends. This picture of it shows that it is not a wise selection for a small lawn.

Another species, of still more awkward figure, tolerable only upon large grounds, is the umbrella-tree, with very large leaves crowded at the end of the branch. It usually requires a strong imagination to see that this disposition of the foliage simulates an umbrella, but some can see what others cannot, and people often grasp at a straw in naming a plant. The blossom is enormous, nearly ten inches across, and a vast disappointment to one who sees it for the first time, after having read of it, as it is coarse and uncouth. I cannot but wonder what has given to this sprawling tree its wide popularity. This species can be found in the "Ramble," also just beyond the bridge under which one passes in going north from the "Menagerie," at Sixty-fourth Street, East.

But a truly noble specimen, the tallest and most shapely of the species seen at the North, is the cucumber-tree or mountain magnolia (*M. acuminata*), attaining a height of nearly a hundred feet. Its bell-shaped, greenish-yellow flowers do not enhance its beauty, but in stately figure and dark luxuriance of foliage it is a conspicuous ornament. A large cluster is in the "Ramble," northeast of what might be called the duck-pond, if it were large enough to have a name.

The large-leaved magnolia (*M. macrophylla*) is the only remaining native species cultivated at the North, with the most tropical aspect of all the group. But our finest representatives of this family, as we are so often compelled to admit, come from abroad, the most important of which is the yulan from China. As it has been referred to elsewhere, it need only be added that its magnificent bloom in April ushers in the spring with more pomp than any other species, native or foreign.

The best-known foreign magnolia is the purple-flowered, and the hybrid between the purple and the yulan, whose mass of immense bloom on leafless shrubs makes it extremely showy just at the season when it will be most conspicuous and appreciated. Other foreign sorts are being introduced, but it seems hardly possible that anything new of this type can rival or displace what we already have.

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THE RAMBLE

IN THE "RAMBLE"—FOURTH EXCURSION

"I shall be your faithful guide
Through this gloomy covert wide."

—MILTON.

AMID such a labyrinth of paths as is found in the "Ramble," no precise route can be laid down, as in our previous excursions; but the actual area is so small that a little patience will bring to view most of the large assortment there collected. It would be difficult, also, to state the precise number of tree-species in this most highly cultivated portion of the grounds; it must be almost or quite a hundred, as I found nearly eighty in a single walk through it. Without cataloguing the contents, therefore, we will describe briefly some of the more interesting or rare sorts that make this perhaps the most favorable spot in the entire Park for this study.

HOLLY.—A beautiful tree or shrub—usually with the figure of the first and the height of the second—is the holly, too rarely seen, whose graceful, glossy, leathery, and evergreen leaf is unrivalled in its kind. Florists are quite as much to be praised and blamed for what is found in lawns as the owners themselves, whose ignorance very often compels them to leave the selection of

plants to the professional dealer; and it is the florist who must be censured for the rarity of this unique and serviceable plant, the holly, especially the English species, which is hardy for the latitude of New York City. Its extremely slow growth is but little excuse, for it can at least be utilized as a shrub. Its delicate white blossoms appear in June, ripening into bright berries that last all winter, while its lustrous dark foliage is an attraction the entire year, suffused with the gladness of Christmas, of which it is the universal emblem.

Our native species is sparingly found as a shrub in the Northern States, but it becomes larger and more abundant to the south and southwest, where it has an altitude of forty to fifty feet. It is slightly inferior to the English holly in symmetry and lustre of leaf, and brilliant color of the berry, but it will become more popular when the public has learned its feasibility of culture, and relies more upon its own taste in the matter of selection.

Paulownia Imperialis.—From the land of flowers, Japan, comes the most tropical, hardy specimen of a large tree that the Park contains—the paulownia, a noble cluster of which borders the greensward lying south of the "Belvedere." Its very name has a lordly resonance, which is justified by its striking proportions, enormous leaves, abundant purple flower-clusters, and beautifully marked trunk. One honors his own dignity by feeling a peculiar admiration for such a master-growth. Another prominent cluster is a little east of the Webster statue, fronting the visitor as he approaches

on the "West Drive" from the south. It is one of the later additions to our sylva, and one writer errs in speaking of its maximum height in this country as being about thirty feet; for many in the Park tower above all surrounding trees; and their massive tops and stalwart forms, at once vigorous and graceful, heavy-foliaged with a catalpa-like leaf often a foot long, surmounted through the winter by large and abundant pyramidal clusters of flower-buds that in June expand into a robe of royal purple, make the *Paulownia imperialis*—with no subserviency to foreign titles—one of the finest arboreal examples in the Park.

Ginkgo.—But our most singular tree in these grounds comes from China, and is becoming popular, though not yet abundant—the ginkgo or maidenhair tree, from the fern-like appearance of its leaf, in which the veining is radically different from that of any other native or foreign tree that we have. Quite as unusual also is the tree's figure, with a very few long branches at an angle of forty-five degrees or more, and numerous short, slender branches closely appressed to the trunk after the fashion of the Lombardy poplar. A single specimen would induce the belief that its skeleton appearance was due to careless or eccentric pruning, but after seeing half a dozen, one is convinced that it is the work of nature. The best cluster is on the western slope of the slight eminence west of the esplanade. It is, in fact, a pleasing curiosity, and as such a single specimen is sufficient for a lawn. A tall tree of this sort is very spindling, but the low growths are not devoid of grace.

Tulip-tree.—Singularly tall—reaching in the West an altitude of nearly two hundred feet—compact, cylindrical, and as painfully symmetrical as a freshly trimmed privet hedge, is the tulip-tree, towering high above everything in the Park except the cottonwoods. It has the prim, expressionless figure of an arborvitæ, its squarish leaf is the most ungraceful of any of our foliage, and, on the whole, without having given me any direct cause for irritation, the tulip-tree rather annoys me. Others, whose sense of beauty is quite as reliable as mine, greatly admire it. Truth to tell, it is a very healthy tree, free from insects—even the bugs don't like it—and when in full bloom it makes a showy appearance. Its name comes from the immense tulip-shaped flower, yellow and orange, and from its no less tulip-shaped fruit, erect and adhering to the tree all winter long. A large tree loaded with these dry slender cups makes a not unpleasing appearance.

When oak, elm, and birch begin to look shabby in fall, this tree's foliage is in luxuriant contrast. Undoubtedly its greatest success is in the brief period of October, when, amid the browns and reds and greens of a brilliant landscape, tall, full-foliaged shafts of golden yellow, alive with fluttering leaves, here and there shoot up above the dogwoods, oaks, and hickories—they are tulip-trees, like giant torches bringing into full relief the deeper hues of the surrounding woods.

Hop-tree.—Half shrub, half tree, the wafer ash or hop-tree adorns many a niche that calls for something more assertive than a shrub, yet too small for the more

pretentious growths. Its three-fingered leaf gives a light effect to the foliage spreading in loose sprays on every side. The flower is small, but in large clusters, and would be highly ornamental if it were not so greenish; but the ripened fruit, in the form of clusters of white, orbicular, winged seeds, like a snowy bunch of hops, is of quite unusual sort, and is very decorative about the last of August. This can well be used to beautify the edge of a walk, or to break the monotony of a small greensward. It is a native of the Middle and Western States, but east of Ohio it is only seen in cultivation.

Larch.—In the larch we encounter a type that distinctly borders upon the evergreens, yet breathing the atmosphere of both deciduous and coniferous trees. The European species, with longer leaves and larger cones, is the one that is cultivated, being the more graceful and thrifty of the two. With its luxuriant and needle-like foliage and pendent branchlets, it is exceedingly effective in a dense cluster. While it suggests the spruce it has none of its austerity.

The leaves, an inch long and slender as a needle, grow in dense clusters as in the cedar of Lebanon. Its deciduous growth and cone-bearing propensities, showing that it stands on the dividing line between two opposing orders of vegetation, give our anti-evolutionist friend another hard nut to crack. The vaporous, vivid green of a million-budded larch in spring is as beautiful in its way as the bluebird's earliest call, and, with it, becomes one of the naturalist's memories and anticipations of that joyous season.

MULBERRY.—A leaf-type is a pretty well-established affair, and one of the standard examples of nature's unswerving consistency. A dozen maple leaves from all over the world bear the maple mark, despite all divergence, and the sub-type of each species is still more inexorable. This is nature's rule; but, though she made the rule, she is not going to stick to it unless she chooses, and herein she asserts the glorious prerogative of her sex. Her conduct in making mulberry and sassafras leaves shows one of her rare incertitudes of mind; *we* call it a "freak of nature"—a most complacent way of hiding our ignorance of the actually controlling principle in the matter. On the same stem one leaf is entire, another is lobed like a mitten, and another has three lobes. But for a miscellaneous assortment of shapes look at a foreign mulberry, the Tartarian, with a perfectly reckless display of variety. Having no clew to the mystery, we calmly label it "exception to the rule," virtually giving nature a little slap for inconsistency, and congratulating ourselves that we would not have been caught making such a slip. If we had an inkling of all the profoundest principles of nature, how it would demolish some of those paste-board structures that we proudly call "the sciences"! It is no unjust depreciation of them, frankly to confess (as the greatest scientists themselves are ready to do) that we are as yet only on the surface of things, in the understanding of nature, and that our present attainments will one day appear as elementary as the three-stringed lyre of the ancient Greeks, compared with a modern orchestra, the alchemy of the Middle Ages, compared with present

chemistry, and the astronomy of Tycho Brahe, compared with our present knowledge of the heavens.

Our native red mulberry has a wide habitat, but is found nowhere abundantly, and I have seldom run across a specimen. It is inferior for cultivation to the two foreign species, the black and the white, though who knows how much cultivation might mend its manners? Our native sort has a very large leaf, rough-hairy on the upper side, and the scanty foliage forms a close flat spray as in the witch-hazel. But the foreign sorts have smaller and glossy leaves of firmer texture, with fruit that is acid-sweet, shaped like an elongated blackberry.

Still another species, the Japanese or paper mulberry, has a leaf almost as soft as down on one side from the mass of fine hairs, and rough as a file on the other side. It flowers the last of May, but its lazy leaves are not fully developed until far into June, which detracts from its worth as a shade-tree. Its pronounced yellow bark is a peculiar feature, and this is often curiously banded with a darker shade. It can be seen across the path from the cluster of weeping beeches. The black mulberry is a fine shade-tree, and a rendezvous for birds in the fruit-season.

FRINGE-TREE.—The popular names of plants often show as little evidence of good taste as those of human beings, and it would be fortunate if they could be revised like their scientific nomenclature; but no title could be more apt than "fringe-tree," which precisely expresses its beautiful appearance when its mass of deep-

green foliage is airily overlaid with its floral tracery of white lace, produced by the countless multitude of long, thread-like petals. The delicate effect is best seen at short distance, a charming device of nature in contrast with the type of bloom displayed by the June-berry, black haw, and thorn-trees. The leaf is dark and firm, keeping its color far into the autumn. The affix "tree" is more for euphony than otherwise, as in its northern growth it is only eight to twelve feet high, though in the Southern States, where it chiefly grows, reaching the northern limit of its range in Pennsylvania, it attains a height of twenty to twenty-five feet.

It is a general characteristic of trees to become dwarfed and shrubby toward the boundaries of their habitat; and not only so in the case of the more tropical growth of the South, which would naturally become stunted in northern latitudes, but also of such as spread from North to South and from West to East. Thus the yellow birch, a hundred feet high in Canada, is hardly forty feet with us; whereas the red birch is largest in the South, and dwindles northward. The white oak has its greatest height in the lower basin of the Ohio, and the hop-hornbeam, a small tree in the East, is fifty feet high in Texas. The nettle-tree, rarely seen in the seaboard States (though I discovered two growing wild in New Jersey), and only sixty feet high in Ohio, exceeds a hundred in the far southwest. Rhododendron, mountain-laurel, and witch-hazel, only shrubs in the North, attain arboreal dimensions in the Carolinas and Georgia; and the linden of the Ohio valley soars 130 feet, but is only half as high near the Atlantic coast; while the spindle-

tree, a shrub of only five or ten feet in New York, has three times the altitude west of the Mississippi. Not to multiply instances, these examples show how sensitive to slight changes in climatic conditions our hardiest growths really are.

Reverting to the matter of popular names, most of them originate either in some fancied or real property of bark, root, or leaf, or in some trivial or utilitarian aspect of the plant. How unfortunate that our stateliest and most picturesque growths should be thus belittled by such commonplace terms. Shingle oak and box elder must be so called because the timber happens to be good for shingles and wooden-ware; "pignut" hickory, because swine eat them; "fetid" buckeye, because of offensive odor; "clammy" locust, because leaf-stems are sticky, when pink locust would have emphasized the glorious masses of rosy bloom; and one of the handsomest oaks must have its vulgar utility everlastingly obtruded upon us in the name of "post" oak, when its cruciform, glossy, leathery leaf affords data for a more dignified title. How prosaic, too, are hackberry, honeyshucks, choke-cherry, cucumber-tree, and sour gum. One of our most ornamental growths in early spring, a white mist in the April bareness, has been nicknamed shadbush, simply because the "run of shad" occurs at about the same time. One of the most honored names in horticulture at the present time is "dogwood"; yet originally it was probably given as an opprobrious epithet, for the worthlessness of its timber; "dog" in past times having been a term of contempt, as it is now under exasperating circum-

stances; but the species of this group have so dignified the title that no odium now attaches to it. As examples of a euphonious and equally significant style of nomenclature that far better befits the dignity of the subject might be instanced the mountain maple, smoke-tree, weeping willow, fringe-tree, staghorn sumach, tulip-tree, silver-leaf poplar, red-bud, hawthorn, silver-bell-tree, and rhododendron (literally, rose-tree). But it is useless to complain: pignut it is, and pignut it will remain; our ancestors have a good many things to answer for, and this is one of the minor sins.

PERSIMMON.—Some botanical writers seem to think that they will degrade their subject unless they give to every species a flattering notice, and the multitudinous synonyms of the word "beautiful" are successively applied to all the species brought under review. Thus one authority—probably more from habit than from an intention to deceive—introduces the persimmon with the strange remark that it is "one of the most interesting of our native trees"; yet I searched in vain in the subsequent biography for a single item that would justify such wholesale praise. Like men, trees are good, bad, and indifferent; and the persimmon is one of the indifferent sort. Its form is unobjectionable, its leaf-type rather colorless, its fruit at its best estate cannot be reckoned among the standard sorts, and, although belonging to the ebony family, its conversion of sap-wood into blackish heart-wood is so slow and limited as to have no commercial value. Whoever likes persimmons after the frost has touched them would do well to culti-

vate it; every arboretum should contain a specimen, and its discovery adds one to the student's list of native trees. The "Ramble" contains two, one of them in the open grass-plot south of the duck-pond; but why was such a conspicuous position assigned to the persimmon?

Sweet Gum.—Near the coast, from Connecticut southward, grows a tree with star-shaped, glossy leaves, of finer appearance than the majority of forest growths, and with something of the oak's assertive figure. This is the sweet gum, so named from its aromatic juices, whose fragrant resinous odor is perceived in the leaf when bruised. Erect, symmetrical, and medium-sized, it lends itself to a variety of situations on the lawn, and is considerably cultivated. In winter the contrast of the blackish, deeply furrowed trunk, and the smooth and hoary branches is quite marked, and the branches are more or less corky-winged. The seeds are in curious hard, spherical pods which hang thickly through the winter, and cover the ground in spring. Whoever has a sweet-gum-tree on his grounds will be visited throughout the winter by large flocks of goldfinches that eat the seeds. As I write this I can count nearly a hundred of them in their brown winter dress close by the window on the ground, busily feeding. The glossy green of summer is followed by an autumn coloring that is the most kaleidoscopic of any tree, in a brilliant combination of purple, yellow, red, and scarlet. Another name for this tree is liquidamber.

Sour Gum.—In this connection we may speak of the sour gum, which, however, stands in no sort of relation

to the preceding. The name of sour gum, to one familiar with the tree's most notable feature, carries his thoughts to the woods in autumn, when, rivalling the dogwood's brilliancy, and of much greater size, before which even the maple pales, it is a mass of vivid uniform scarlet, the most striking feature in the scenery. It has a wide range, though not one of the more abundant trees. The leaf is "simple and entire," as a botanist would say, inclined to the obovate in form, and by no means "stylish"; and the shelving sprays of foliage help one to identify the tree at a long distance. It is essentially a forest-growth, tolerated rather than favored in cultivated grounds. In the West it is called pepperidge, but its Indian name, tupelo, is the prettiest—too sweet for its sour juices,—and as we wish to make the best of an indifferent matter, we will always hereafter call it tupelo.

KENTUCKY COFFEE-TREE.—To know a tree thoroughly it must be studied in winter: this season is a great revealer of secrets. Trees are sometimes as big hypocrites as men and women, and when you see one that in summer is all suavity and grace, wait till winter before you make a final estimate. An elm carries one disposition through the year; but some species are the incarnation of a snarl from fall till spring. Such a one is the Kentucky coffee-tree, its few coarse branches snappishly angular; its appearance quite justifies its other name of "stump-tree."

The botanist knows what to expect in the way of foliage when fine twigs are lacking—there will probably

be a display of large compound leaves, or possibly, as in some magnolias, huge simple leaves a foot or two long: with such verdure there is no place for twigs. Winter's harsh angularity is thus atoned for. But one who is not a botanist has no such knowledge wherewith to keep his courage up, and turns in some disgust from the unsightly figure. Six months of the year it may properly be said of the Kentucky coffee-tree that it is not fit to live, "cut it down; why cumbereth it the ground?" Throughout May, all but the expert would declare it dead. But early in June it begins to awake from its long stupor, and slowly to put forth its leaves—and such leaves! The observer wonders if they will ever reach their full dimensions; on and on, foot after foot, the compound leaf unrolls; doubly compound, in fact, until it sometimes attains the enormous dimensions of three feet long and two feet wide, containing over a hundred leaflets, each of itself a sizable leaf. With such a task before it, no wonder it procrastinates its budding every spring. This is the largest of all native leaves, beautifully symmetrical, dark green when mature, and bright yellow in autumn. Its name comes from the fact that the first immigrants to Kentucky used its berries as a substitute for coffee—needless to say, a poor substitute, and soon dispensed with for the genuine article. Few comparatively have even heard of the tree, for, though widely distributed in the country (though never in New England), it is one of the rarest, and never grows in clusters—is not gregarious, as we say of animals; not social, speaking humanly. I have seen but one specimen in the Park, on a slight elevation on the east side

of the "Ramble," in a large open space, as must needs be if it is to have full development. Trees ought to be very grateful to mankind, and probably are, for taking them out of a state of nature, and putting them into a state of grace. What ambitious but often disappointed affairs dense forest-growths are; climbing over each other, as it were, to reach the top and sunlight, where alone they are verdant, and all below leafless and branchless, tall barren trunks, a wilderness of gaunt forms. Nature has the ability but not the room, the landscape-gardener has the room but not the ability; but let the two work in conjunction, and nature finds the chance to realize the ideals she has had from the foundation of the world. Its late vernation and unsightly appearance for half of the year prevents the coffee-tree's wide cultivation. For six months it is uncouth, for the next six luxuriant and stately, and all the year a curiosity. Its June flowers are small and greenish-white, the staminate in very short racemes, the pistillate in clusters nearly a foot long, followed by pods somewhat like those of the honey-locust.

Siberian Pea-tree.—A genuinely feminine type of sylvan growth is the Caragana or Siberian pea-tree, its light pinnate foliage in drooping sprays, enriched with abundant small clusters of yellow flowers of pea-shape, presenting a graceful but not assertive aspect, with the mellifluous mood of a Keats or a Shelley. There are all varieties of temperament in the trees of the "Ramble," and an imaginative mind would find it a pleasant task to wander through these winding

ways, and find the silent counterparts of humankind. A very similar growth to the foregoing is the bladder-senna (*Colutea arborescens*), also pinnate and yellow flowered, but the flowers are in racemes instead of umbels, and the leaf is odd-pinnate instead of even-pinnate; which is the scientific side of the matter, and prosy enough, I hope, for those who have no sympathy with nature's "temperament" and "poetry." The caragana fails of true arboreal dimensions as completely as the staghorn sumach, but it fills a small place in a large way—which furnishes a good motto for all ambitious folk.

Cedar of Lebanon.—The species of most antique interest in the Park is the famous cedar of Lebanon, a dark, stern-looking evergreen that takes our thoughts across the sea and thousands of years into the past. This very tree might be descended, with only two or three intermediate generations, from one that lost its life at the building of Solomon's temple, more than five hundred years before Plato, Socrates, and all the art and poetry of the Greeks, and shows the length as well as brevity of human history. Solomon was the most famous botanist, zoologist, and polygamist of ancient times. "He spake of trees, from the cedar-tree that is in Lebanon even unto the hyssop that springeth out of the wall; he spake also of beasts, and of fowl, and of creeping things, and of fishes." What would not modern science give for a transcript of the botanical, zoological, ornithological, entomological, and ichthyological lore of that voluptuous old wiseacre!

The leaves of this cedar are much like spruce-needles, but clustered as in the larch, and the cones are globular. Besides the one in the "Ramble," near the boat-house, is a fine specimen about a hundred feet or more east of the "Bethesda Fountain," and another on the east slope of the Bolivar eminence, on the west side.

YELLOW-WOOD.—A native tree that is but little known, rare even in its habitat, which is in the Southern States, and not yet widely cultivated, is the yellow-wood. Its greatest altitude is only fifty feet, but it is usually of much lower growth, and its habit of dividing the trunk quite close to the ground gives it a more shrubby appearance. Its lithe branches, weighted with long pinnate leaves of from seven to eleven leaflets, spread and droop most gracefully, and its finely dissected foliage makes it desirable for picturesque ornament rather than for substantial shade. Late in June long loose clusters of white blossoms hang from the ends of the branches, and the leaflets have a way, oftentimes, of falling one by one and leaving the stem bare, whose swollen base, when detached, is found to be a hollow cup enclosing the next year's bud.

WILD YELLOW PLUM.—One looks so eagerly for bloom in spring that he will give to the wild plum a more cordial welcome in early May than a few weeks later. It has just one talent; but it took warning and put it out at moderate usury, so that it was not summarily deprived of it, and one is likely to run across its small but pretty clusters of white flowers in any moist

situation that is thinly wooded. Its fruit might be better or worse—more easily better, and is of variable color. It is readily distinguished from similar growths by its sharp thorns.

Common Sandthorn (*Hippophae rhamnoides*).—We must not fail to mention (though not found in the "Ramble") a tree that is interesting both for itself and for its rarity—the sandthorn of Europe, of which there is but one example in the Park, bending over the "West Drive" just at the point where the entrance driveway at Ninetieth Street meets it. It is half tree, half shrub, with narrow leaves not much over an inch long, green above and silvery-white beneath. The flowers are rather inconspicuous, and ripen into orange-colored fruit; the branches are somewhat thorny. The observer will be struck by the foliage and drooping figure of this interesting specimen.

Walnut and Butternut.—A large and luxuriant walnut is a massive, stately growth that ought to monopolize an extensive greensward for its full effect, albeit a trifle too symmetrical to be very picturesque. Its great compound leaf is rich-hued and shapely, the handsomest leaf of all our timber-trees, and the blackish bark gives a tone of solidity and strength. It is of westerly growth and comparatively infrequent in the Eastern States. The so-called English walnut (*Juglans regia*), though really from Asia, is in the Park, but it is not distinctive enough from our own to call for special comment.

Closely allied to the walnut is the butternut (*J. cinerea*), which is a hopeless case for cultivation. Though the leaf-type is almost identical with that of the walnut, the foliage effect is very inferior, becoming so withered and shabby even in August (when the leaves begin to fall) as to be unsightly for the rest of the year. The butternut's figure also has none of the walnut's noble character. Aside from these disparaging features, it can be recognized by the peculiar light tint of the bark, and the stickiness of the leaf-stem and of the nut, the latter of which has a maximum of husk for a minimum of kernel.

Oleaster.—The semi-arboreal species of oleaster known as *Elæagnus angustifolia*, from the Orient, deserves mention as a beautiful rarity. Its small, tapering leaf is *silvery-white* on the upper side, a novel effect that contrasts admirably with surrounding verdure. Its shrubby form adapts it easily to lawn-culture, and those in quest of something that will not be duplicated on all their neighbors' grounds will find it in this oleaster.

Osage Orange.—The "Ramble" shows several osage-orange-trees, which are at once conspicuous by their tall forms, thorny branches, yellow-tinged rough bark and tapering entire leaves. The "orange" part is a delusion and a snare, being only a globular, yellowish-green mass, from four to five inches in diameter, produced by the aggregation of ripened pistils, and not at all edible. Its thorns make it very serviceable for hedges, for which it is becoming popular, and it has the

further advantage of growing rapidly. This is an "extra-limital" tree, native to Texas and the southwesterly part of the country.

PAPAW.—In the shade of other trees grows the papaw, from instinct or from its darksome situation oftener a shrub than a tree. It belongs to the great custard family of the tropics, and is one of only three species that have wandered hither from the far South. It is abundant in the Mississippi valley, and, though rare, has spread eastward to Pennsylvania. Tropical foliage is so typical that one will rightly guess from the leaf that the plant is kindred to the magnolia. The blossom, in early spring, has the peculiarity of being first green, then brown, and finally a deep purplish red. It is rarely seen, even in cultivation, and is an interesting specimen for anyone in search of novelties.

SILVER-BELL-TREE.—One who has never seen the silver-bell-tree in bloom might naturally think that the name is a foolish bit of poetry applied by an overardent admirer. But so far from being extravagant, it is the only appropriate name that could be given. In spring, before the leaves develop, this tree puts forth its supreme effort of the year, and swings on every twig a silvery set of chimes, burying trunk and branch beneath the innumerable mass. The bells, an inch long, are of elegant form and texture, and it is worth a visit to the Park to see the brief but exquisite display. The largest cluster is a little east of the Webster statue, grouped with paulownias, magnolias and a red-bud. Of south-

erly growth, it is hardy even into New England, and ought to be more widely cultivated.

EVERGREENS. — In addition to our native pine, spruce, cedar, hemlock, etc., the Park shows many fine species from abroad that reveal the decorative character of the evergreen or coniferous type of growth much better than our native sorts. The most varied displays are in that small area chiefly devoted to evergreens just northwest of the "Ramble," and around the Bolivar statue on the west side are several unusual species. An interesting variation from our white pine is the imposing Himalaya pine (found in the "Ramble" and elsewhere), conspicuous for its immense drooping tassels of long needles, nearly twice the length of our pine-needles, and cones proportionally large. It is probably the most observed evergreen on the grounds. A very compact and ornamental pine, but quite small, is the *cembra*, a cluster of which is not far from the Bolivar statue and the cedar of Lebanon. For a small type of pine this is the choicest in cultivation. The needles are of a handsome dark-green tint, and the growth is very luxuriant; still another is the *mugho*, a dwarf tree or shrub, with leaves in twos, whereas in *cembra* they are in fives.

But the two most abundant pines in the Park are the Scotch and the Austrian, the former with short bluish needles, and a distinctly red tinge in the trunk toward the summit, the latter with long, stiff, dark-green leaves and a very rough grayish bark. It presents much the appearance of our native red pine, but in thrifty condition

is more luxuriant and effective. Unfortunately neither the Scotch nor the Austrian pines thrive very well in these grounds, and the former in many cases are so lean and scraggly that it is a wonder they are tolerated. Something should be done, and done quickly, for a poor tree is worse than none. The European yew (*Taxus baccata*) is in much the same evil plight, and not one of the many specimens I have seen is a credit to the place.

It sometimes seems as if nature had put before us a number of almost identical forms just to pique our curiosity and tempt investigation, to find out exactly what she means by each of them. And as soon as we put in the entering wedge of inquiry, how those similar forms instantly begin to separate, till they stand apart in such clear distinctiveness that we wonder we could ever have been so stupid as to fail to see their individualities. And when we hear a liberally educated man make a random allusion to pines and spruces, that shows that he could not, for the life of him, tell them apart, we only smile commiseratingly and say to ourselves, "Poor man, you can see, readily enough, the difference of Greek and Latin roots, and how *can* you be so blind as not to know a pine from a hemlock?"

It is singular that the evergreen species which we perhaps regard most indifferently, seldom planting it for ornament, and usually with dubious results—the white or Weymouth pine (*P. strobus*)—at its best estate is the most majestic and imposing of all our Eastern trees. Comparatively few have seen it in perfection; but its broad sweep of huge horizontal shelving branches and

towering shaft command an admiration beyond even that of the elm and oak.

Pines are distinguished from all other conifers by the clustering of the leaves or needles in twos, threes, or fives, and the white pine is the only native species having them in fives. This is strictly an American growth, reaching from Canada to Virginia, and attaining its fullest development around the Great Lakes. It is a kingly figure, this specimen of forest gianthood, and it will be a rare moment of experience when the reader first sees one that has attained its ideal; and as he looks upon its almost sublime and unapproachable proportions he will be tempted to exclaim, "There is but *one* tree —the white pine!"

Red, yellow, and pitch pines have their utilities, but can never come into the charmed circle of cultivation, while botanists, who can find cause for praise where no one else can, are significantly silent regarding those two pitiable species, the Jersey scrub pine and the gray pine of the North.

Our most popular spruce (a genus wherein the "needles" are *four-sided*, and grow thickly from all sides of the branch) is the now naturalized Norway spruce, recognized by its extremely long cones, and pendent branchlets hanging from the nearly horizontal arms. It is such a fine tree, and thrives so well under American conditions, that it is becoming a little wearisome from its ubiquity. It is not generally known that our native white spruce (*Abies alba*), when large and luxuriant, is quite as decorative, with sometimes a silvery sheen that reminds one of a silver fir. The black spruce (*A.*

nigra) is seldom cultivated. These two native species are distinguishable, in one respect, by the fact that the white one sheds all of its cones every year, whereas the black spruce retains them for several years. The Park contains also a spruce from the Black Sea (*A. orientalis*), and the Colorado blue spruce (*A. pungens*).

The most admired firs in the world (a genus with *flat* leaves, mostly in "two ranks," *i.e.*, on opposite sides of the branch) are the beautiful silvery-tinted species, which are quite rare. In their native habitats they are often large and stately, but the cultivated specimens are quite small. The Park contains two sorts, the Colorado silver fir (*A. concolor*), and Nordmann's silver fir (*A. nordmannii*) from the Crimean Mountains. Here, too, are the balsam fir (*A. balsamea*), from which comes our Canada balsam, and the Southern analogue of the same (*A. fraseri*).

The hemlock (*Tsuga canadensis*), a North American product, is a distinctive tree to be proud of, but its appearance in the Park does not do it justice. In luxuriant condition it combines the temperaments of coniferous and deciduous growth very effectively.

Junipers, erect and prostrate, are well represented here, and illustrate a curious type of vegetation that is repugnant in detail but decorative in the mass. They can be studied to good advantage around the Bolivar statue; all sorts of conifers in that locality seem to thrive better than elsewhere.

A beautiful Japanese evergreen is the *Cryptomeria*, more graceful than most of its class, a low tree with rather spreading and drooping branches thickly studded

with short, curved, pointed leaves. Another, with minute, heath-like leaves, unusually beautiful when luxuriant, is the *Retinospora ericoides*, and equally fine is *Retinospora pisifera*, a most elegant species of cypress. This is quite abundant, and can be recognized by its flat sprays of foliage, resembling arborvitæ, and covered with a white "bloom" on the under side. These last three can be found close together in the area chiefly devoted to evergreens just north of the "Ramble," a hundred feet west of the Reservoir. Throughout the Park one may find fully forty species and varieties of coniferous growth, some of them in a confirmed state of invalidism, and a few so stately and ornamental as to be an incentive to the study and cultivation of this unique section of our sylva. It is earnestly to be hoped that the conifers of the Park, as representative of the world's best growth, will soon be brought up to the high standard of its deciduous trees.

Nothing shows better the wide variety and profusion of growth in the Park than the impossibility of making an *absolutely* complete inventory of its contents. After the most thorough search by the various gardeners, whose lists form the basis of the present catalogue, I chanced to find an oak that had not been recorded, and later, two foreign species; doubtless this does not make the record perfect.

One of the two was the white-beam-tree (*Pyrus aria*) of Europe, which is close to the small building on the west side, near Sixty-sixth Street. It is noteworthy as

having one of the most distinctive types of leaf, of leathery texture, dark green and lustrous above, whitish beneath, and with a deeply serrate-crenate edge—a leaf that would attract notice, looking more like a *Quercus* than a *Pyrus*. Its outline is on Plate IV. of foreign trees.

The other discovery was a Japanese tree (*Idesia polycarpa*), whose leaf misled a gardener into calling it a mulberry, but when I called his attention to the abundant clusters of small yellowish flowers, it was conclusive evidence. This will be found overhanging one of the walks near the Conservatory.

Besides the four routes of our excursions one can take many other walks that are favorable for botanical observation. Of these I would especially recommend the paths along the "West Drive," from Fifty-ninth to Seventy-second Street, the vicinity of the East Seventy-second Street entrance, the circuit of the so-called "Pool" on the west side, at about 102d Street—one of the most delightful spots in the Park—the paths in the vicinity of the Conservatory at East 106th Street, and the circuit of "Harlem Mere," at the extreme northeastern corner of the Park.

SHRUBS AND VINES

"I sat me down to watch upon a bank
With ivy canopied, and interwove
With flaunting honeysuckle."

—MILTON.

WITH all their distinctiveness of form and temperament, one soon finds that trees, shrubs, and woody vines are essentially one in nature —a classification of convenience, not of science, with no organic difference between the trailing arbutus and the *Sequoia gigantea*. The unbroken gradation from the clinging ivy to the sturdy oak is so imperceptible that precise characterization of the above sort is often difficult or impossible, and strictly scientific treatment of these three forms of growth is comprised under the single title "Dendrologia."

More than a quarter of all the trees of our territory are also to be reckoned as shrubs; climate and soil largely determine whether a species will have the figure and stature of the one or of the other; the rhododendron is a tree in the Southern States, but only a shrub at the North; black haw and hornbeam assume both forms in the same locality; some diminutive growths have a thoroughly arboreal figure, and some unmistakable shrubs are taller than some trees; lofty trees of the far West dwindle to low shrubs in the East, and the same is true of many species in their northerly and southerly range.

The distinction of shrub and vine is even more perplexing; a score of familiar instances illustrate the dual or indeterminate type; the poison ivy, if it finds no support, knows how to support itself, and grows erect; the matrimony-vine is neither exactly vine nor shrub. The countless circumstantial differences, as striking as they are beautiful, thus evinced in one common nature, are not only a link of some worth in the evolutionary argument, but they insure that freedom from angularity that is an essential charm of all landscape scenery.

One who sees in a plant only the few obvious details given in this book for identification misses much of the wonderful scheme of vegetation, and of the beauty of a thousand features, which are recognized only after thorough study of structural botany. But that means an amount of labor which to many is distasteful. There is too much popular disinclination in these days to go deeply into the science of things; learning must be made easy; reading must take the place of study; everything must be illustrated. The mind will grow superficial under this treatment. It is to be feared, from the present trend of nature-study, despite its popularity, that the old-fashioned, thorough-going race of botanists will in the next generation become extinct. Inspiration is doubtless better than information; yet intelligent enthusiasm always thrives best on a good subsoil of scientific training.

In mass and brilliancy of color, very few plants, native or foreign, can rival the gorgeous rhododendrons. The original wild species are few in number—only one

native to our territory—but the florist's art has produced a splendid assortment, by grafting the floral excellences of one upon the vigorous stock of another, and by such commingling of tints as gives to this genus a peculiar pre-eminence among shrubs.

In foliage it much resembles its near kindred, the azalea, the leaf of each being thick, leathery, entire, elliptical, and dark green; and the flowers are of much the same type, yet with the evident difference (at least in the wild varieties) that the azalea blossom has five stamens, that of the rhododendron ten. This is one of the few shrubs distinctly preferring shade to sunshine, and this fact must be taken account of, if it is to be successfully cultivated.

Certainly in our northern latitude there is no surprise more brilliant in store for the naturalist than to discover the rich, full-blown clusters of a rhododendron gleaming in the dark woods. Most of our cultivated specimens have foreign stock grafted or budded upon our native *Catawbiense*, the exotic species being too tender to thrive upon their own roots. Another native rhododendron, *R. maximum*, or great laurel, thrives as far north as Connecticut, and is a splendid growth, bordering on the arboreal, which it fully attains in the Southern States. This blossoms in July, later than all others of its class, varying in color from pink to white.

The leaf-type of the genus is much the same as in the magnolia, heavy and stiff, nearly or quite evergreen, and admirable in its way, though far from graceful; and the figure of the entire plant, in harmony with the foliage, is rigid and almost clumsy, yet with a rough vigor and

individualism that are as refreshing as a cool breeze on a sultry day.

Is there any flower of the woods that the explorer is more glad to discover than the delicate but showy azalea? This is a small brother, as it were, of the rhododendron; of less massive type, but far better adapted to the limitations of garden or conservatory. While the type of flower and leaf is closely modelled after that of the rhododendron, the latter has evergreen foliage, whereas the azalea is deciduous.

To begin with our American species, the least pretentious is the small-flowered clammy azalea, which is superior, nevertheless, to many other sorts in its extreme fragrance; yet it is hardly one to be chosen for cultivation. The purple azalea—a misleading name, as it has a variety of colors—also called pinxter-flower, is the most widely distributed, and among the most welcome of May flowers, its profuse bloom burying the shrub in rich tints. Of more surprising brilliance, however, is the flame-colored azalea, indigenous in our territory only in the southern portion, blossoming rather late in summer, and one of the comparatively few contributions of the New World to Europe, which has adopted it among its choice shrubs.

But in this as in many other genera, the Old World leads the New, which is not surprising, if in the origin of species the radiating centre was in Asia, the source of many so-called European species; and it may be to this fact as well as to peculiarly favorable soil and climate that the region of Japan and China is so pre-eminent in the choicest forms and colors of vegetation. From the

neighborhood of the Black Sea and the Mediterranean comes the widely cultivated *Azalea pontica*, from China the very small-leaved *A. amœna*, a splendid species, from Japan the *A. mollis*. But the bewildering confusion of superb tints shown in florists' windows and conservatories is the result of hybridizing, in the union of various native and foreign species—composite forms whose lines of heredity are lost to all but the professional horticulturist.

It is not amiss to remark, in passing, that it is no affectation, even in the unscientific nature-lover, for whom these pages are especially designed, to be somewhat familiar with the botanical names of plants. The advantage of scientific nomenclature is that, as a rule, a plant is generally known by a single name, and allusion to it under that name leaves no ambiguity; whereas widely distributed species, if popular, are often differently named in different localities; just as in birds the golden-winged woodpecker, which is found from Maine to Texas, has more than a dozen titles; and others, like the oriole and bobolink, have several. Particularly is this advice valid where a favorite genus has both native and introduced species, the latter seldom with a popular name in our country, and distinguishable from the native only by the scientific Latin term. There is hardly a cultivated genus among us that is not enriched by foreign importation, and the only way to avoid embarrassment in the case of our many spiræas, a multitude of leguminose plants, etc., is to adopt the botanical designation. This means a little extra labor, but the satisfaction is commensurate.

Roses are too familiar to require extended notice in this review; but allusion should be made to one that is peculiarly adapted for broad landscape-effect by being cultivated in dense masses, which is exceptional in this class of shrubs. This is the *Rosa rugosa*, justly popular for its unusually fine, vivid foliage, large pink single blossoms, and conspicuous bright-red "hips"; being especially hardy, easily cultivated, and disposed to spread, it can be massed effectively on extensive grounds, as well as trained into detached shrubs. Among the several varieties will be found single and double flowers, rose-red or white; but emphasis should be laid on its rich foliage quite as much as on the blossom.

A genus containing several valuable species, the best of which come from Japan, is the barberry. As a class they are prickly, with small leaves, yellow flowers, and bright-red berries remaining far into or through the winter. Some of them are quite dwarfish and are massed effectively in broad clumps; others are four to eight feet high. Although of delicate figure, they admit of better treatment on spacious grounds where they can form a dense, ample growth. There are few types of vegetation so distinctive as the barberry—a delicate, hardy ornamentation, attractive the year round. The peculiar vaporous green of the opening buds is a charming sight in spring, and its refinement of foliage is quite as important a feature as its pretty clusters of small yellow flowers.

Spiræas, on the contrary, find their most effective feature in the bloom, which is of so characteristic a type as to be easily recognized amid all the numerous species,

to which artificial culture has added many fine varieties. One of the commonest and, comparatively speaking, coarsest is the nine-bark, that grows freely in damp localities, and gets its name from its peculiar bark that peels off in numerous thin layers, much as in the grape-vine. Some writers speak slightingly of it, others recognize its worth, and it is widely planted in the Park with excellent effect. Some plants, like the diminutive *Deutzia gracilis*, are for the closest scrutiny, others are for longer perspective; and, with its multitudinous globes of small white flowers, enveloping a shrub of substantial size and strong foliage, this nine-bark is in many situations quite as satisfactory as the more refined sorts; its variety, *aurea*, has yellow leaves, and mingles finely with other foliage. The countless clusters of ripened pistils assume so deep a red that one sometimes mistakes them, at a distance, for a mass of inflorescence.

Still humbler sorts of spiræa are the meadow-sweet and hardhack, abundant on open, sterile ground, which greatly cheapens their real worth; if they were tender plants, and named "japonica," they would be admitted to the lawn and garden. The most prized spiræas, some with white, others with pink or crimson flowers, come from abroad—and here again China and Japan take the lead—a few showing beautiful variegations of foliage late in the season. Some spiræas blossom early, others late, the many species affording continuous bloom from early spring to the end of summer. The profusion and graceful arrangement of its flowers, with its easy cultivation and hardiness, has given this section of the rose family a wide popularity.

Currants add a small quota to the embellishment of a lawn. Passing over the sorts that are cultivated for fruit, and whose flowers are greenish and inconspicuous, a few species are desirable on the score of beauty, particularly the Missouri or golden currant (*Ribes aureum*), bearing small but very pretty yellow flowers with spicy fragrance in late spring; its yellow fruit also is not to be despised. Another kind, *sanguineum*, has bright red and yellow flowers in midsummer, with a variety producing double flowers, but on account of its early bloom the Missouri is the more popular.

As a thing of beauty there is little to commend in our American hazel-nut, and the European species in its original form has no advantage over our own; but two "sports" of the European really belong to the class of decorative plants. One of them has cut-leaved foliage that gives beauty to almost any type; but the most important is the purple-leaved hazel-nut, unique for its almost black foliage in spring and summer, perhaps the nearest approach to black that is to be found in vegetation, much darker than in the purple-leaved beech, thus making it conspicuous amid any and all surroundings; but the color largely "burns off" by fall, when it would be easily mistaken for our own species. For strong yet not inartistic punctuation of a landscape nothing is finer, as the contrast is as pleasing as it is curious.

A considerable portion of the Park's white adornings in June comes from that important genus in the honeysuckle family known as viburnum, containing several species with a showy profusion of bloom, largely native,

with a few introduced varieties, lending a charm to numerous walks throughout the southerly portion of the Park. The viburnums lack some of the attractions of other shrubs, are not odorous and fine-foliaged, in fact are a little coarse-fibred; but they have a style of their own—and individuality always commands a premium —are strong and hardy and running over with petaled whiteness, and in the embellishment of large grounds can scarcely be omitted.

One of the most showy of the class is the so-called guelder rose, or snowball-tree, covered with dense masses of large sterile flowers, a modified form of the cranberry-tree—the term "tree" being only complimentary in both cases, as the height is only five to ten feet. The Japanese snowball, *V. plicatum*, the finest in the Park, has abundant "heads" and a handsome leaf, not flat, but distinctly plicate or plaited, from which comes its specific name. Quite common is the species called arrow-wood (*dentatum*) with full heads of small perfect flowers (*i.e.*, with pistil and stamens). With similar flowers but very different foliage is the black haw, both tree and shrub, described elsewhere. In the same list are the withe-rod, downy-leaved viburnum, and maple-leaved arrow-wood, which one is glad to meet in woodland rambles, but would look a little askance at, if they forced their way into the select society of cultivated grounds. But the cranberry-tree and the hobble-bush, with large marginal sterile flowers surrounding the compact clusters, are important enough to be availed of in the Park. With the immense volume of color demanded in such an area, one must not be too fastidious

as to its source; and, to tell the truth, at long range these humbler viburnums "fill in" just as well as lilacs or hawthorns.

A most distinctive type of shrub, with all the formality of coniferous evergreens, yet finely contrasting, by its remarkable compactness, with the loose foliage of other growths, is the tree-box, not native to America, but indigenous in Europe and Asia. It is a dwarf tree, its highest altitude not exceeding fifteen feet, but when only three feet in height its single shaft gives it an arboreal figure. It is a tall brother of the trim little box that has been used *ad nauseam* to border garden-walks, and which ought to be called the spinster plant, as being the most exasperating example of diminutive vegetable precision. Our tree-box, *Buxus sempervirens*, though not a bit less prim, somehow escapes the odium, and in many situations is a most desirable shrub. When closely trimmed, its small dark-green leaves are so solidly massed that its identity can never be mistaken. It yields to the shears most readily, and can be trimmed into conical and globular shapes without the impression of ridiculous artificiality; but the poor thing is often imposed upon, and nature insulted, by carving it into grotesque forms of four-footed beasts, hens, roosters, and other birds of prey.

Its timber is among the few sorts that sink in water. There are varieties, leaves larger or smaller, and variegated with white or yellow, but they substantially fill the same niche, as a small, elegant, thrifty evergreen.

You can about as easily tame a squirrel as you can tame the sumachs into conformability with lawn pro-

prieties. If you insist on keeping them within prison-walls, you must at least leave them pretty much alone. For small grounds they are simply impossible; they spoil their surroundings, and their surroundings return evil for evil; but in semi-rough nature, in some fragment of a lawn that is not supervised too much, they feel at home and are interesting.

The best native species are the dwarf and the stag-horn; the latter aspires to be a tree, and very rarely succeeds; the dwarf is about the most satisfactory, nor is it so dwarf as the name implies, as it sometimes reaches a height of fifteen or twenty feet; unlike the others its pinnate leaves are very glossy, and it rivals all its kindred in autumn's fiery brilliancy. One of the most strikingly effective little trees in the Park in October proved to be the dwarf sumach. The cut-leaved variety of the smooth sumach is very ornamental.

If you have spacious grounds, create in a far-off corner a semblance of nature's wildness, mingle sumachs with low shrubbery and scattered trees, and a refreshing glimpse of unconventional freedom will be afforded.

Never fraternizing with these humble sorts is the more elegant Venetian sumach, better known as smoke-tree; but it takes a microscope to see the relationship. If it were human it would probably wish to repudiate its connections, for it moves in a much higher circle than its country cousins ever aspire to. This makes an elegant centre-piece for a small greensward when wrapped in its smoky cloud; but at other times, with its long-stemmed round leaves, it has nothing special to com-

mend it, except in late spring when covered with a profusion of very small yellow flowers.

The prevailing colors of flowers are white, red, and yellow; blue and purple figure very little in nature's painting; so that the genus *Amorpha*, containing two or three species in the Park, is at least a novelty, with its indigo blossoms, whose form—having but *one* petal —must be accounted as a caprice or a negligence of nature; it is abnormal, amorphic, according to our limited interpretation of law.

The leaf, as so commonly in the great leguminose family to which the amorpha belongs, is pinnate with numerous leaflets, the number in one species sometimes not less than fifty-one. The flowers are small, but repay examination, not only for their oddity, but for the mingling of purple and yellow in petal and stamens; while their aggregation in numerous erect spikes affords a rich yet sombre effect. Thanks are due to any plant that blossoms quite early or quite late; and one species of *Amorpha*, called the lead-plant, is the more acceptable in bloom for delaying the matter till August.

The prominent feature of the genus *Euonymus* is its bright red pods, which so envelop the plant in autumn as to give it the apt name of burning-bush. A more matter-of-fact name is spindle-tree, afforded by the utility of its wood in the manufacture of spindles. Our two native species are in the Park, with the addition of the European in two or three varieties. The purple or purplish-white flowers have no marked beauty. A shrub particularly handsome in its glossy evergreen foliage is the *Euonymus japonicus*, which is quite hardy, at least as

far north as New York City; a variety of it has yellowish markings on the leaves; such variegations are more odd than beautiful, in the estimation of some.

Perhaps no plant so generally carries our thoughts back to childhood and to the old home that possibly now exists only in memory, as that deliciously fragrant flower, the lilac. It belongs to the year's childhood as well, and all its entwined associations make it as heartily welcome as violets. If pansies are for thoughts, lilacs are for memories.

Abundant as it is, it is not indigenous in America, but comes originally from Asia Minor by the way of Europe. In addition to a dozen or more distinct species, cultivation has produced valuable varieties, yet the old-fashioned sort holds its own amid them all. The lilac is said to have been introduced into more countries than any other plant; and, in view of its early bloom, luxuriant clusters, exquisite fragrance, and withal, hardiness and easy culture, this is not to be wondered at.

In addition to many varieties developed from the original species (*Syringa vulgaris*), with the different tints of lilac, white, reddish-purple, crimson, blue—practically alike except in color—we have Persian, Chinese, and Japanese lilacs, with flower single and double, of various colors, and with such interblending of qualities by hybridizing as to baffle even the scientist in the attempt to disentangle the snarl of hereditary lines. Every horticulturist has a mercenary incentive to put a new variety of this and other popular plants on the market; occasionally it becomes a permanent form; oftener it reverts, sooner or later, to the original form, and

nothing more is heard of it; rose after rose has been the favorite of an hour, only to be supplanted by another short-lived favorite. The naturalist, as such, will not concern himself with these ephemeral phenomena, that almost cheapen nature's original simplicity and beauty. Yet it is undeniable that art has often assisted nature, by bringing inferior species into a finer quality of growth, and it is a difficult question at what point art must leave nature alone; for horticulturists are vying with each other in attempts to transform every stamen into a petal, and every simple flower-cluster into a huge mass of bloom, so that catalogues are now thickly sprinkled with *flore pleno* and *grandiflora*.

That section of the rose family that furnishes our choicest fruits—apple, cherry, peach, plum—and comprised in the genera *Prunus* and *Pyrus*, is usually regarded as utilitarian rather than ornamental, or at least, as not meeting the high standards of lawn culture. But by the improvement of certain native species, with the introduction of choice kinds from abroad, the names of cherry, apple, etc., are becoming associated with our most ornamental sylva and flora. This is signally the case in the Chinese crab and the Japanese flowering apple, the latter a pigmy tree only five to six feet high, profusely covered with beautiful red blossoms in spring, and scarcely less interesting when the flowers are followed by an abundance of diminutive apples. One writer calls it "the most beautiful of its race, and one of the best ornamental plants in cultivation." It is thoroughly hardy, and has a variety with semi-double flowers. The Chinese crab, *Pyrus malus spectabilis*, is

of true arboreal size, a variety of it having full-double flowers, two inches across, and very fragrant.

Passing from apples to cherries, there are several species, mostly foreign, that have very ornamental bloom. Few trees in the Park are more attractive when in blossom than the wild black cherry; all frequenters of the "Ramble" must be familiar with the remarkable specimen in the northwest corner, near what is now the "Reading-room." Besides this species, we have the wild red cherry, and the bird cherry of Europe, the double-flowering Chinese cherry, and some from Japan; and all are familiar with the flowering almond, of Asiatic origin, whose stems are buried in pink and white blossoms in early spring. From the same source comes the double-flowering peach in various colors, varieties of the familiar peach-tree. Of ornamental plum-trees the most important is perhaps the Persian purple-leaved plum, *P. pissardii*, a low tree or shrub, decorative in foliage rather than in flower. And lastly, no lawn should be without the Japanese quince (*Pyrus japonica*), one of the freshest delights of spring, decking the still leafless bush with an abundance of large pink or sometimes white blossoms, the very emblem of spring's fairest anticipations. After the flowering season is past—though it develops blossoms at intervals all summer—the shrub is still attractive for its dark and almost glossy foliage. This brief list emphasizes the versatility of that pre-eminent botanical group, the rose family.

Seldom does one find cultivated forms credited to Siberia; yet that inhospitable land gives to the Park five delicate leguminose species of the Siberian pea-tree—

tree only by compliment, for it is oftener a shrub. All the species have the pinnate leaf that is characteristic of the family, and mostly yellow pea-shaped blossoms. Though hardy, they have a delicate appearance, due to the soft texture of the finely cut leaves; and the differences of the species are such as would interest the botanist rather than the landscape amateur. Blossoming in May and June they do not attract attention by conspicuous features, and can easily be overlooked from resemblance in flower and leaf to many other species.

The reputation of the entire dogwood family has been made by one illustrious member of it—the flowering dogwood, referred to particularly elsewhere. While this is equally at home on the lawn and in the woods, his kindred for the most part modestly remain in the background, and, truth to tell, there is little reason why they should be invited to come forward into publicity. The naturalist, however, is always glad to meet them in their chosen haunts, and they offer interesting differences for the scrutiny of the analytical botanist.

The common forms are the round-leaved, alternate-leaved, silky, panicled, and red-osier dogwood. The last-named, with an almost identical European form, has a special interest as being the only case in which a shrub's ornamentation is in neither foliage, flower, nor fruit, but in the brilliant color of its bark in winter. From May to December it is a dull brown, but it then begins to brighten, and by February is of such a vivid crimson tint as to make a large shrub in a snowy landscape one of the most peculiar and beautiful sights of winter. In foliage and flower this is as commonplace

as its kindred, but it is often cultivated for its novel winter-coloring.

The dogwoods as a rule have white blossoms; but the foreign Cornelian cherry (*Cornus mas*) is decked in early spring with showy yellow flowers; two varieties of the same have white or yellow markings in the foliage; such effects are thought desirable by some, but to my own taste it is more of an oddity than an ornament; certainly at a distance the effect is decidedly that of withered leaves, rather than of a rich mingling of colors; a criticism that is not so valid in the case of house or garden plants.

In the chill days of November it is almost pathetic to see the witch-hazel's leafless branches thickly covered with small bright yellow blossoms, as if in the despairing attempt to revive the glories of a summer that is gone. This is the latest flowering plant we have, and is an object of botanical interest; but neither foliage nor flower warrants its introduction to cultivated grounds, except on the score of mere variety. Its autumn coloring is sometimes effective, and its oblique leaf has a peculiar contour that is worth noting; but it is a rather coarse-natured individual, with just enough delicacy to appear embarrassed amid cultivated surroundings. It is growing in two or three places in the "Ramble."

Little need be said of the familiar and universally popular syringa (so called), whose exquisite fragrance, purity of color, and profusion of flowers, with shapely foliage, give it rank among the most desirable shrubs.

There is an unfortunate confusion in the names of two of our favorite plants—lilac and syringa; the botanical

name of lilac is *Syringa*, and that of syringa is *Philadelphus;* and horticultural writers are constantly urging the public to name the plants correctly. I hope they will succeed, but I suspect that lilacs will be called lilacs, and syringa syringa, to the end of time.

Syringa—I mean Philadelphus—is a genus of about a dozen species, the world over, and our common sort, *coronarius*, is an imported plant that has developed several quite distinct varieties under the process of cultivation, with double flowers and peculiar markings of foliage. A native species of the Southern States, *grandiflora*, has larger blossoms than the *coronarius*, which are also quite as pleasantly scented as the latter; but it is probably not hardy enough to supplant its foreign rival. Hybridizing has put many varieties on the market, whose advantages are very evident to the hybridists themselves, and more or less so to others.

A synonym for fragrance is honeysuckle, although in some of the species this is not a significant feature. The genus—botanically called *Lonicera*—is widely represented in different countries, particularly those of the north temperate zone, whereas its southern extension is limited. Our native shrubs in this group are quite inferior, and scarcely worth cultivating, with so many choicer foreign species to choose from.

The flower-type is tubular or funnel-form, lobed and somewhat irregular at the apex, with five stamens, and the leaf is ovate, oval, or long-ovate, entire and opposite. In foliage honeysuckles are inferior to many other shrubs, and the blossom, as a rule, is quite small (which is measurably compensated for by its profusion), of vari-

able tint, cream-white, pink, crimson, purplish, and yellow, with berry-fruit, which is red, orange, purple, or black, and sometimes more attractive than the flower.

The Park shows a goodly array of this genus, though the differences of species are in some cases scarcely observable except to a botanist. One of the most abundant is the *fragrantissima* from China, with a characteristic found only or chiefly in this species, so far as I know—a loose shreddy bark that peels off in long strips, as in a grape-vine or nine-bark. This is about the earliest to bloom, and it is aptly named, as the tiny flowers are superlatively fragrant.

Another, widely used to border the walks, is the Tartarian honeysuckle which blossoms later, with some variation in flower-tint. The fruit of this is quite as ornamental as the flower, often remaining till far into autumn, untouched by the birds, thanks to its unpalatableness. Several other species might be named that are less widely known, with differences more delicate than conspicuous, except in the case of *L. hildebrandii*, from Burmah, with shining leaves, and crimson flowers more than six inches long, a comparatively rare species in this country. About a dozen sorts of honeysuckle may be found in various parts of the Park.

Closely allied to the honeysuckle—probably often mistaken for it—is the Weigela, a much more showy genus with larger flowers, though with almost the same floral type, but the leaf is serrate, not entire as in *Lonicera*. The bloom of the foreign weigelas is quite beautiful, but the only species native to our territory, *W. trifida*, is scarcely more than a weed, growing in open

sandy ground; its yellow blossoms are in threes, hence the name *trifida*. The best of the species come from Asia, and are mostly to be found in the Park.

A desirable little bush, throwing out its clusters of purplish, rose-tinted, fragrant flowers in early spring before the leaves appear, is the *Daphne mezereum*, which has been for a long time popular in England. In June its dark-green, lance-shaped leaves are illuminated with bright red berries. Commendable in all respects, this dainty specimen will fill a niche as very few other plants can do. In the same genus is the garland flower, *D. cneorum*, with lilac-tinted flowers thickly clustered, and very small evergreen leaves. Its first flowering is in May, and at intervals it blossoms through the summer and even in fall. Another, *D. genkwa*, has violet flowers, also before the foliage. This is a trio worthy of becoming favorites—low, delicate, with fragrant showy bloom in early spring, and attractive in foliage. The flower has no corolla, the salver-shaped, four-lobed colored calyx supplying its place.

The rose of Sharon might almost be the proverbial "last rose of summer"; certainly this species is left blooming pretty much alone, for it is well into September when it is densely covered with large flowers of various pure or mingled colors, with scarcely a rival in the field. The shrub has a particularly erect and even jaunty air, that attracts attention before it blossoms. I never pass a rose of Sharon without seeming to hear it say, "I had an ambition to become a great tree, but was denied the opportunity." Possibly the lower growths have their disappointments as well as we that are higher

in the scale. The leaf is of peculiar shape, with the middle lobe quite tapering, and the large numerous pods remain through the winter. Whether it be the beloved flower of olden Jewish times or not, it is pleasant to think so, and its probable origin in Syria—whence its botanical name *syriacus*—makes it at least plausible. It is the last large and brilliant flower of the season, except the late sporadic blossoms of the Japanese quince, and fades with the incoming of October, a landscape shrub of great beauty, and doubly effective from its period of bloom.

The palmate type of leaf is the rarest of all, so that when one sees the dwarf horse-chestnut for the first time, he confidently pronounces it a species of the *Æsculus* group ; but on looking at the very slender spikes of flowers, a foot long, generally white, thickly covering the bush in July, the difference from the horse-chestnut creates a little doubt ; yet the flower is essentially the same, only a variation in the mode of clustering, one of those incidental circumstances that produce variety with little or no organic difference. As a writer has well said, nature is very sparing in fundamental types, but lavish in variations. As it spreads quite rapidly and tends to form a large clump, it is hardly a feasible plant for small grounds, whereas under suitable conditions it is desirable. Two clumps of it are in the "Ramble," one near the north end of the "Bow-Bridge," the other farther to the east, near the cluster of magnolias. Indigenous only in the Southern States, it proves quite hardy in the North, and is not fastidious as to the kind of soil. A kindred species, the red buckeye, also of the Southern

and Western States, with bright red flowers in short clusters, is of more arboreal figure, and would be called a dwarf tree, rather than a shrub.

An excellent genus of rather large shrubs, whose flowers are of the beautiful camellia type, is *Stuartia*. It is a small group, and we hardly need to go abroad for its representation, as two of the finest species are native to Virginia, and hardy up to Southern New England, if planted in not too exposed a situation. In *S. pentagyna* the cream-white blossoms, nearly four inches across, develop in July and August. The five or more petals are finely scalloped on the edge, and the stamens are very numerous. The foliage is good, and as the shrub attains a height of ten to twelve feet, its appearance in full bloom is striking. A smaller sort is *S. virginica*, with purple filaments in the stamens, blossoming in June and July, and with a different foliage. The Japanese species, *S. pseudo camellia*, not much known in this country, has much the same features, and scarcely rivals our native forms.

Sea-shore exposure requires special selection for the lawn, and a native species, popularly called groundsel-tree—though only a shrub ten to twelve feet high—"to the manor born," is desirable for such localities, and will doubtless thrive inland equally well. The foliage is dark green, and the flowers, in small, compact clusters, are white in some plants, yellow in others; for the pistillate and staminate blossoms grow on separate plants.

The wild rosemary of Europe, also native to this country, bears the botanical name of *Andromeda polifolia*, applied, in a spirit of poetry that is painfully lack-

ing in scientific nomenclature, by that prince of naturalists, Linnæus, who saw the tragic episode in the life of that royal (and therefore beautiful) maiden pictured in the color and the aqueous situation of this delicate plant, often less than a foot high. The poetic temperament of those famous pioneers in botany and ornithology, Linnæus and Audubon, who could thus infuse their subjects with the spirit of delightful imagery, has really done more to elevate and popularize these two domains of nature-study than all the microscopic precision of exact science. Imagination fires mankind more than the whole mass of technical detail in matters of fact. Yet one must not forget that these details, rightly used, are the best fuel to kindle the imagination.

Pieria, in Thessaly, the gathering-place of the Muses, gives generic name to a select group of small hardy shrubs in the heath family. Two American species, *P. mariana* and *P. ligustrina*, throw out their white bell-shaped flowers in abundance in April and the first part of May, while an introduced species, *P. floribunda*, in addition to the same floral effect, has evergreen foliage. Quite as desirable as either of these, however, is *P. japonica*, whose evergreen foliage is glossy, the old leaves being replaced in spring by new ones that are at first bright red, soon changing to green ; and the early bloom of pure white flowers in long clusters completes the picture of an exquisite growth in every respect. Farmers naturally think more of such practical things as calves and lambs than of all landscape values, and, from a probably fanciful notion of its poisonous effects, have cast a lasting slur upon the delicate *P. mariana*, by call-

ing it stagger bush ; but it thrives serenely unconscious of the odium.

Another mythological genus is *Cassandra*, with apparently only one species, *calyculata*, or leather-leaf. Its thick-leaved foliage is impaired by its rusty appearance beneath ; but in early spring the long, one-sided racemes of small white bell-shaped flowers are very pretty. The buds are so advanced in the previous August that they look as if almost ready to break into flower ; but they "bide a wee," and come out bright and early the following year.

Zenobia speciosa is too proud a name for a small shrub, the only one of its genus, with white, waxen flowers of the heath type, small but multitudinous, and with an added interest from its long popularity, if it be true, as asserted, that it was cultivated as long ago as that famous lady of Palmyra lived. It is closely allied with the three foregoing genera, mingles well with growths of other types, and is sufficiently distinctive to be of interest to the mere flower-lover as well as to the botanist.

Laurel is an exclusively American genus—a comparatively rare occurrence in vegetation ; and if we would do ample justice to "home production," this beautiful growth would be oftener seen in cultivation. Like azaleas and rhododendrons, this virile group forms a small and characteristic section of the notable and extensive heath family, which, besides the above-named, large-flowered and hardy sorts, furnishes many of the most delicate and minute forms of inflorescence found in conservatories.

The finest species of laurel is the broad-leaved or

mountain-laurel—*Kalmia latifolia*—that in June breaks out into a broad, compact mass of blossoms, varying from white to rose-color, each shaped like a miniature bowl with a row of ten depressions around the middle, in each of which an anther is neatly socketed. A smaller and less showy sort is the narrow-leaved laurel—*K. angustifolia*—often found in open pasture-land, and called lambkill by farmers. This is doubtless a false and unkind aspersion; very possibly foolish lambs have indigestion after eating it; so would a three-months-old baby, if fed with meat and potato; and there is probably as much inherent poison in the one case as in the other.

Another species, *K. glauca*, has purplish flowers, and a fourth, growing in Virginia, a rosy-tinted corolla. The only sorts desirable for cultivation are the broad-leaved and the narrow-leaved; and they need only to be heralded on coming from Europe or Asia to secure wider recognition of their worth.

Another strictly American group is the small one called Calycanthus, chiefly known through a favorite species, the sweet-scented shrub, *C. floridus*, that has become popular in Europe. Flower, foliage, and bark are aromatic, the blossom when warmed emitting a fragrance quite like that of the strawberry. Being purplish and not clustered, the flower is not a conspicuous ornament, but its aroma and the thickly foliaged, shapely bush have won a wide recognition at home and abroad. A less known species, *C. occidentalis*, in California, is of greater size, with ampler leaves and dark crimson flowers three inches in diameter.

A third genus, supposed to be indigenous only in America, is another small group in the heath family, named *Clethra*, and known as sweet pepper-bush or white alder. The finest species found in our territory is *C. alnifolia* (*i.e.*, alder-leaved), whose abundant, dense, erect clusters of showy white, odorous blossoms, contrasting finely with the glossy foliage, and often in continuous bloom from July to October, make it a most desirable shrub for any lawn. Its congener, *acuminata*, said to be widely cultivated in England and on the Continent, is essentially the same except in the shape of the leaf. Other species, less hardy, are only to be seen in conservatories.

Generally in the heath family the petals are united more or less by their edges, but in *Clethra* they are entirely separate. In most families the anthers open from end to end to discharge the pollen, but as a rule in the heaths it escapes through a small opening at the apex of the anther; and in the barberry this aperture is provided with a minute hinged lid that covers the top until it is time to open!

A fourth genus of American plants is *Shepherdia*, of but few species, and chiefly in repute on account of one, *S. argentea* (silver-leaved), known as Buffalo berry. Seldom does a shrub exhibit such strong contrasts of color; the foliage is silvery-white on both sides; in April or May appear the clusters of small but abundant yellow flowers, which ripen into showy scarlet berries.

The heaths include one more American group of ornamental shrubs—*Leucothoë*, containing six or eight species. The flowers are white, rarely rose-tinted, in

terminal or lateral clusters, and the leaf thickish, nearly or quite evergreen, and glossy in *L. racemosa*, which is perhaps the most widely cultivated. *L. axillaris* is commendable for its early blossoming, a circumstance not to be forgotten in laying out a lawn or garden. The flowers throughout the genus are of the typical heath form—petals united into a short tube, lobed or toothed at the apex.

The most conspicuous and brilliant reminder of our Japanese indebtedness is the golden-flowered forsythia, abundant in the Park, to which allusion is elsewhere made. The secret of its profuse flowering is in trimming it closely every year as soon as the blossoming period is past; for next year's flower-buds form chiefly on *this* year's growth; and if the stems are severely pruned, the vigor of the plant sends up a multitude of new shoots crowded with buds of the coming spring. Its slender, dark-green leaves, persistent almost till winter, are an added consideration to make this thoroughly hardy shrub one of the most beautiful attractions in almost any situation.

Our native elders, though having a shapely leaf of fine color, are of scattering growth, and so characterless as to be unfit for culture. But the European elder—*Sambucus nigra*—affords some varieties of marked beauty, the finest being the cut-leaved, very ornamental in foliage. Another, the golden elder, has yellow leaves which, massed with surrounding greens, is of striking effect; and a third, with variegation of white and green, is an oddity that is more or less pleasing.

The two species indigenous in this country, the com-

mon and the red-berried, have conspicuous differences: the former, usually with seven to nine leaflets, has blackish berries and white or pinkish pith; the latter, usually with five leaflets, has red berries and brown pith. Both are partial to swampy ground, and may be looked for on the margin of ponds and streams.

Pre-eminent for its massive flower-clusters stands the Hydrangea; the foremost in hardiness and wide cultivation, *H. paniculata*, has been improved by horticultural art, so that its immense clusters produce a superb effect, and justify its pretentious title—*Hydrangea paniculata grandiflora*. Its catalogue of virtues is a long one —hardy, with ornamental foliage, of prolonged inflorescence, and with its gorgeous white pyramids changing at maturity to a beautiful blush that deepens to a rich pink followed by a delicate brown; it is *sans pareil* in its exceptional character, and, coming into bloom with the opening of September, it nobly crowns the summer's glory, and is probably the most popular of all shrubs.

Without rivalling this, yet in some ways quite as beautiful, especially in its glossy foliage, and with its blossoms similarly overspread with pink or blue, is the half-hardy *H. hortensis*, with large globular clusters, oftener seen as a potted plant, though more and more left out of doors in winter well protected. Horticulturists have, of course, produced varieties of this species, each supposed to exhibit some special excellence, as in tint or arrangement of flowers, or in variegation of foliage; but such distinctions are often so minute as to be chiefly valuable as an advertising pretext.

Japan and China, as usual, are our main resource for ornamental hydrangeas. Worthy of mention, though inferior, is our own oak-leaved—*H. quercifolia*—with large sterile blossoms mingled with the fertile ones in the same cluster. The process of cultivation always tends to transform stamens and pistils into petals, making the flower only for show, without the means of self-propagation, resulting usually in such metamorphoses as we find in the cultivated rose and chrysanthemum with a multitude of petals. But there is a singular difference in the process, in the hydrangea, wherein the flower's force is expended in simply *enlarging* the calyx—it has no corolla—instead of multiplying the number of sepals. It may here be remarked, that while color and form—mere sensuous beauty—may be equally appreciated by all, intelligent interest in nature's processes of growth, which afford a considerable part of the subject's attractiveness, is quite impossible without an understanding of structural botany; and this is where the modern "short methods" of nature-study reveal their superficiality.

Among the rugged, dark-green-foliaged shrubs and trees, one of the most interesting and sometimes practically valuable genera is the alder; too coarse-fibred for good effect at short range, it can be massed along a water-course, pond, or lake very satisfactorily; indeed, there is nothing that quite takes its place in that situation. Its growth is thrifty, and its compacted roots prevent erosion of the shore. Our three native species are all shrubs, with no conspicuous differences, and a practical value of them all is their protection of tender

plants in wind-exposed localities, as they are too vigorous to be affected by any climatic inclemencies. The European alder is a tree, whose dark trunk and foliage make it a pleasing accessory of a water-scene, showing to advantage in several places in the Park, and it is luxuriantly covered with yellowish catkins in early spring.

It is not too much to say of the *Deutzia gracilis* that it is the most chaste and elegant little shrub that we have; and it is an almost inevitable corollary of that proposition, that it comes from Japan. In texture of petal and leaf, in form and purity of its delicate white flower, and in that atmosphere that is not reducible to words, it is so singular that it might be called a thrush among the flowers. Some plants must have their location carefully considered; they are more or less fastidious; they might mar, or be marred by, their surroundings; but the little deutzia, like a kind word, fits in anywhere.

Another species much cultivated, *D. crenata*, is not materially different, but lacks the purity of color and the dainty diminutiveness of the *gracilis*. A larger shrub is *D. scabra*, which is literally overwhelmed in bloom in June, and the leaf, which is very scabrous, is a most beautiful object under the microscope, the roughness consisting of silver stars, having six to ten rays, thickly covering the field. Other species, varieties, and hybrids bring the number up to eight or more now in this country, but the type of the genus is most finely expressed in *Deutzia gracilis*.

A group for the most part tropical or sub-tropical, but containing a few species hardy in the Northern States, is *Styrax*, whose type of flower and leaf much

resembles that of the silver-bell-tree elsewhere described. Of our three native species, one or two are worthy of cultivation—*S. grandiflora*, about six feet high, and the lower *S. obassia*, the flowers of both clustered in racemes. But a better species is the one from Japan, *S. serrulata*, with finer leaves and larger blossoms, of quite an arboreal figure with spreading branches. Its hardiness and adaptability also recommend it, with perhaps the only drawback that its flowering period is very brief.

The fact that a plant blossoms as late as September or even October attracts attention, and becomes a large inducement to its cultivation. We have two such species in the *Desmodium* genus, both of foreign growth—*D. penduliflorum*, of purplish-rose color, and *D. japonicum*, with white blossoms. The flowering is profuse in both if well trimmed each year, and the effect of drooping flower-laden branches so late in the season is particularly pleasing.

Closely allied to the spiræa is a small genus, *Exochorda*, better known as pearl bush, from the tint of its blossoms. It comes from China, and is quite hardy in the Northern States. Properly treated it is ornamental, but as its foliage is scanty it must be pruned quite close. As in spiræa the beauty is mainly in its bloom.

A shrub only four or five feet high, but with a single shaft that makes it arboreal, is the leather-wood, whose clustered, greenish-yellow flowers develop before the long and tapering leaves. Its chief interest is the remarkable character of its bark, which is as impressionable as softened wax, but at once regaining its shape

when the pressure is removed, and extremely tenacious, so that the Indians utilized it for bowstrings and other purposes. As a curiosity it is well worthy of cultivation where space permits.

A genus affording a rich yellow bloom late in summer —July to October—is *Hypericum*, or St. John's-wort. Many of its herbaceous species are indigenous and very familiar, but within our territory only two are in shrub-form, the most important being *H. kalmianum*, which is chiefly found in the vicinity of Niagara Falls. It has become a favorite flower in England, and its bright yellow bloom in August entitles it to wider appreciation in America. Yet it is rather surpassed by several kindred species from abroad, such as *H. aureum*, quite a small plant, but with larger blossoms than our own, and *H. moseriana*, with flowers sometimes two and a half inches across, which is perhaps not hardy enough for Southern New England without protection in winter. It is needless to name other species that do not differ materially from the foregoing. A peculiarity in all the genus is in the opposite entire leaves that are conspicuously spattered with black dots, though not observable at a distance. This group is valuable for its golden bloom at a season when it is most welcome.

A tall thorny shrub that is often a tree, and used for hedges in England, is the common buckthorn—*Rhamnus catharticus*—with simple, opposite, ovate leaves, and very small but abundant and fragrant flowers, mostly white or pink. Though growing wild in some parts of New England it is a naturalized European species. Its general type is so much better represented in the various

thorns of the *Cratægus* genus (hawthorn, black thorn, etc.) that it will hardly come into popular favor.

Some genera, like acacia, contain several hundred species; but occasionally a genus-type has but a single representation, like *Stephanandra*, in the rose family, in many respects resembling spiræa; but a marked difference is in its more ornamental foliage, which is reddish-purple in spring, then changes to a lustrous green, and in autumn resumes its spring-tint. In the flowering season the whole plant is enveloped in white bloom; its native haunts seem to be in Japan.

Few genera call for such extended notice, for their contributions in ornamental trees and shrubs, as the universally popular magnolia; and the shrubs of this group are perhaps its most important section. Among the early spring flowers nothing is more conspicuous than the large purple and white blossoms of the *M. purpurea* and *M. soulangeana*, so profuse that the leafless branches are completely enveloped in bloom. The former has purple on the outside and pure white on the inside of the flower, whereas the latter, probably a hybrid, has a white flower that is suffused with purple. Even *M. purpurea* is regarded by some as a hybrid. Both come from China and are perfectly hardy. In tint and texture of petal they do not compare with the more elegant rhododendron and azalea, but in mass of showy color they eclipse every other shrub we have. The buds, formed in the previous year, are large and prominent throughout the winter, as if eager to throw off their velvet wrappings with the first warm touch of spring. Another foreign species, *M. alexandrina*, has large pink

flowers, and in *M. gracilis* they are a rich purple. Conspicuously different from all others is *M. stellata*, a hardy sort from Japan, also in the Park, whose small flowers have about fifteen narrow petals, rayed like a star. It blossoms very early, is fragrant, like most of the magnolias, and its smaller size makes it more suitable for some situations than any of the others.

Our only native species in shrub form—and even this is quite arborescent—is the swamp magnolia, or sweet bay, *M. glauca*, whose extreme northern limit is probably Cape Ann, in the northeast corner of Massachusetts. This has smaller blossoms than most of the others, but remains well in flower, and is quite fragrant. The leaf-type is essentially the same throughout the genus, and the rich heavy foliage partly atones for the rather ungraceful figure of most of the species, and affords a pleasing contrast to other greens. It is unnecessary to enumerate the other species and hybrids in cultivation, as the differences are not very conspicuous.

The genus mulberry, containing several interesting trees, is here referred to only to call attention to a curious and beautiful variety that might be reckoned among the shrubs, effected by grafting pendulous stock upon a short shaft—the Russian weeping mulberry. The leaf is very unique and variable in contour, and the mass of luxuriant growth sweeping on all sides to the ground, completely hiding the supporting trunk, is singularly beautiful.

A genus little known, but affording a valuable accession to our list of ornamental shrubs, is *Elæagnus*, or oleaster, whose special characteristics are foliage that is dark

green above and silvery-white below (sometimes entirely white), and a profusion of usually bright red fruit about the size of currants. The one native species worth cultivating is *E. canadensis*, or Missouri silver-tree—though its greatest height is about ten feet—which produces fragrant yellow flowers in July and August, its foliage silvery throughout. The Japanese *E. longipes* is one of the finest, and about five feet high, though in its native land it is many times higher. Its combined effect of dark foliage and bright fruit is striking, the latter being utilized in France for preserves, and highly esteemed. The wild olive of olden times is another species of the group, called *E. angustifolius*, and sometimes Jerusalem willow. New species are being introduced and tested, and this genus should be kept in mind in selecting for the lawn.

Itea furnishes a single hardy shrub, *virginica*, worthy of cultivation. The foliage, green in spring, afterwards changes to a distinct red, and in June the plant is abundantly decorated with the bloom of white racemes; growing wild as far north as New Jersey, it is hardy enough for general cultivation.

Corylopsis, native only to Asia, has only recently been introduced into this country. It is characterized by yellow fine-petaled blossoms in showy lateral racemes, which in at least one species, *C. spicata*, develop before the leaves. That this species is a favorite in Japan is sufficient endorsement for its rapid introduction. The few other sorts in the genus need not here be particularized, as they strongly resemble *C. spicata*, whose bright spring bloom makes it a welcome addition to our shrubbery.

Symphoricarpus contains two species of small shrubs whose white and red berries, respectively, have given them the names of snow-berry and coral-berry. They are delicately foliaged, and produce small but very pretty pinkish flowers in mid-summer. The snow-berry has fewer but much larger and handsomer berries than the coral-berry, in which they are dull red and crowded on the stems. Both grow wild in our territory, but are chiefly seen in cultivation.

Antedating the flowering of the forsythia by at least two weeks is a plant which, in its type and color of blossom, might easily be mistaken for it—the early-flowering jasmine (*Jasminum nudiflorum*) from China, very conspicuous in its solitary bloom. Being a prostrate shrub, it verges on the vine, and can be effectively massed in an upright position against the house, where it shows with fine effect. The later appearing leaves are trifoliate. It is on the east side of the "Ramble."

Allied to our angelica-tree is a thorny shrub from China (*Aralia chinensis*), of lower growth, and with minute differences that indicate diverse origin. This is in the Park, with another (*A. pentaphylla*), from Japan, whose leaf is palmate with five leaflets. Both may need slight protection in winter.

The Chinese chestnut, so called (*Xanthoceras sorbifolia*), found in the Park, is but little cultivated as yet in this country. It is very showy in bloom, producing an abundance of long clusters of white flowers, and the compound leaves are not unlike those of the mountain-ash. Not being especially tender, and of graceful figure,

it ought to become widely popular, especially as its bloom is among the earliest.

One would not naturally think of selecting the swamp blueberry, *Vaccinium corymbosum*, for ornament; and he will usually be surprised at the attractive appearance it can be made to present, when properly trained, in its abundant array of greenish-white heath-like blossoms, in early spring. The time of year is half the secret of it. Although rather coarse-natured as a whole, the hungry eye is almost as delighted at seeing it as if it were some rare exotic. It is too shrewd to display its limited charms in June. It is quite a large and conspicuous object in the "Ramble," and several of its fellow-vaccinia are distributed in the Park.

One of the choicest evergreen shrubs is the English holly; and a handsomer effect in vegetation is rarely seen, when its dark, thick, glossy foliage is illuminated with an abundance of bright red berries; in leaf and fruit it is distinctly finer than our native species. A bewildering number of varieties, many of them with curious effects of mottled foliage, is catalogued, but it is unnecessary here to describe their slight differences. The Japanese species, *Ilex latifolius*, is considered by one Japanese traveller to be the finest evergreen of its sort in that country, its leaves not less than six inches long, more glossy, if possible, than in the English holly, and the berries more brilliant; unfortunately it is not hardy enough for the Northern States. *I. crenata*, said to be the most popular holly in Japan, has leaves only about one inch long, finely serrate, and black fruit. Our own holly, *I. opaca*, ignobly brings up the rear,

and, though abundantly used and beautiful for Christmas decorations, is manifestly inferior to the foreign sorts.

A closely related shrub, but deciduous, and popular for winter decoration, when its leafless branches are loaded with red berries, is the winterberry or black alder, a native growth, and a familiar object to those who explore the woods in autumn.

The most polite way to warn off intruders upon your grounds is by a hedge. Fences are semi-civilized and only fit for cattle. Stone walls must have their asperity tempered by vines and mosses to be picturesque. Hedge-rows are one of the most beautiful devices of English scenery, but one looks upon the high bare walls there as a personal affront; whereas a hedge is such a gracious refusal of admission that it pleases rather than offends.

Among many shrubs used for the hedge, privet is one of the commonest, a genus with no American representative. Its many species are not as distinctive as in some genera, but the genus-type is strongly marked—leaves small, long-oval, entire, opposite and of firm texture, in some species glossy, in the South evergreen, and remaining fresh in the North long after most other leaves have fallen. Delightfully clean and fresh in appearance, hardy, quick-growing, accommodating themselves to all soils and conditions, the privets are a good-natured folk, adept in finding the pleasant side of every situation—the result of good health as much as of grace of heart. If not trimmed, the abundant small white flowers in panicled clusters, often fragrant, are a

pleasing feature; but in hedge-form, when the new shoots are closely cropped, there is little opportunity for blossoming. The commonest is the English privet or prim, in two or three varieties, with berries black or yellow, and leaves box-like or variegated. The so-called California privet is a case of false credit, as it really originates in Japan. This is quite a feature in the Park, especially on the south declivity of Bolivar hill, on the extreme west side, where it forms a miniature grove, most noticeable in fall, when its remarkable foliage retains all of its spring freshness.

Not to be confounded with viburnum is laburnum, the latter a leguminose genus, whereas viburnum is in the honeysuckle family. Laburnum has no American representative, but two or three beautiful foreign species are in the Park, with pinnate leaves and yellow flowers in long pendent racemes, whence the name of golden-chain. They are upright, arborescent shrubs, of feminine figure, and an effective growth amid sturdier forms.

Another leguminose genus is *Colutea*, with bright-green compound leaves, and making a brave show of yellow blossoms that are followed by almost translucent bladdery pods, so hardy as to grow at the very summit of Mt. Vesuvius. The commonest species is called bladder-senna.

The thorns—*Cratægus*—are often classed as shrubs, assuming indifferently the forms of shrub and tree; but having already been considered as trees, they may here be passed over.

No lawn should be without a *Kerria japonica*, also

called corchorus; for among low shrubs it has few equals. The very foliage, of delicate texture, beautiful tint and graceful contour, bespeaks its refinement; and when profusely laden with golden-yellow flowers, it is a gem fit for the choicest situation. The double-flowered variety was first introduced, but strangely enough it is quite inferior to the original single-flowering form which is now becoming prevalent.

A recent introduction from Japan, characterized by large pure-white blossoms rather abundant but single at the ends of the stems, and by large ovate leaves finely jagged on the edge, and conspicuous in late fall for their remarkably vivid tint, is *Rhodotypos kerrioides*, thickly planted along many walks in the Park. Few plants retain their bright verdure so long, and through summer and autumn scattering blossoms are never absent, though of that sporadic sort that does not greatly beautify the plant, after its true flowering season is over. For October greenery it cannot be excelled.

A shrub that never seems to know when to stop blossoming is the purple-flowering raspberry, *Rubus odoratus*, a peculiar plant of the wayside, the woods, and the select surroundings of the garden—all things to all men. Its huge three-lobed leaves are not unsightly, unlike other raspberries it has no prickles, its showy purplish-rose flowers are two inches across, and its stamens are legion—or, more exactly, about 200! It is only for show, as its large flat berry is very insipid; but if kept within limits it is interesting and attractive in cultivation, though one is better pleased to meet it unexpectedly in the wildwood.

Even in horticulture utility is sometimes paramount to beauty, which is almost the only excuse for alluding to the Myricas—coarse-fibred shrubs that can withstand all attacks of wind and weather, and are serviceable as a defensive growth for other low plants in sea-side lawns. So tenacious that they seem to court hardship, there appears to be no exposure too severe for them, and two of them thrive in the most barren soil. Yet it must be conceded, despite their commonness, that the foliage is most pleasantly aromatic, and the dark-green leaf almost glossy and of good texture.

The most useful is *M. cerifera*, also called wax-myrtle and bayberry; and in winter this is covered with whitish pellets—minute globular cones coated with a waxen substance that has some commercial value for soap and candles, one pound of wax being obtained by boiling four pounds of berries. This species is three to six or even eight feet high; but *M. Gàle*, or sweet gale, is a lower plant with a smaller leaf, growing close to the water. The third native species is *M. asplenifolia*, or sweet fern, whose task seems to be to cover the most sterile and unattractive spots it can find. The humblest object in nature is full of suggestion if we only know how to look at it, and nothing is to be despised. Sweet fern is a case in hand. If one will look at the leaf illustration (Plate IX.) of shrubs, a curious bit of nature's forethought in structure will be apparent, which had never occurred to me until I prepared the drawing. As a rule the two parts of a leaf, on opposite sides of the mid-rib, are very symmetrical, and in the most intricate configuration, as in oak and maple, lobes

and incisions correspond with surprising exactness. But in the sweet fern, the incisions, which are very deep, and reach almost to the mid-rib, are as uniformly *alternate* on the two sides. A little thought will explain this almost solitary exception to the rule. The incisions are so numerous and deep that the mid-rib would be much weakened and liable to break if they exactly coincided, but acquires rigidity by the simple device of alternating the incisions, whereby the mid-rib is strengthened on one side when weakened on the other. I shall always have more respect for this despised weed after such proof of painstaking in its construction.

For those whose grounds adjoin a lake or pond, the familiar button-bush, *Cephalanthus occidentalis*, is worth considering. It grows in water, has luxuriant, dark-green foliage, and showy clusters of white flowers, densely massed into spherical heads; the leaves are opposite or whorled.

I have seen no shrub in the Park whose glossy evergreen foliage surpasses that of *Mahonia aquifolium*, perhaps the most desirable low species of its sort. The leaf is pinnate, and each leaflet is the duplicate of the English holly leaf, but with a lustre that can scarcely be rivalled; and being in the barberry family, it is often called holly-leaved barberry. It comes from the Far West, and, though called evergreen in the books, it does not prove so in the Park. Its short racemes of small yellow flowers are produced early in spring, and followed by blackish berries. It should be included in every list of lawn shrubbery, however small.

It is difficult to conceive of a more extraordinary, delicate, and beautiful shrub than the Tamarix, or Tamarisk. It is an exclusively foreign genus, and it can truly be said, there is nothing more charmingly singular in the Park than the few specimens scattered here and there. The finest is the African, its lithe, willowy branches literally buried in the countless tiny blossoms of early spring before a leaf appears. Yet the climax is not in the bloom, but in the full-foliaged effect, its million leaves as minute as the lobes of the most delicate fern, making the entire shrub a misty mass of translucent green, too ethereal for description. The first view of such an one as is found in the "Ramble" can only be greeted with an exclamation. This will seem fulsome praise only to those who have never beheld the plant, and are not imaginative enough to picture it. Nature was in her most poetic mood when she devised the African tamarisk, and when she came out of it she fell to making the Jersey scrub pine and persimmon.

Within a few years a unique type of foliage ornamentation has come into great favor, in the curious, finely cut, and richly tinted leaves of Japanese maples—shrubs in size but arboreal in figure, and forming one of the most delightful contributions of that favored land to our Western sylva. From the leaf one would never dream that these were maples, but the winged fruit is an unmistakable sign of kinship to our popular species. The blossom, as a rule, is an inconspicuous feature in these, as in European and most American maples, but the pink flower of *Acer japonicum* is very pretty. A species becoming widely cultivated is *A. polymorphum*, with a

delicate five- to seven-fingered leaf; a variety of this is dark purple, and this again has a cut-leaved sub-variety, producing a most exquisite fringed effect in the mass; in spring particularly, when the new foliage takes on a crimson shade, the effect of the pendent branches is superb. A variety of *A. japonicum* has yellow leaves that mingle well with dark foliage. Another sort has a commingling of rose, green, white, and yellow on the same tree, which would be *bizarre*, were it not for the matchless tints and the elegant contour of the small leaves.

These growths are among the most important acquisitions of recent times, and are particularly desirable for small grounds, yet none the less giving a peculiarly graceful touch in the daintier landscape scenes of the more spacious park.

The foregoing genera, which are well represented in Central Park, contain our best ornamental shrubs, native and foreign, that are sufficiently hardy for outdoor culture throughout our territory; and the leading species in each genus have been mentioned in detail.

It may be of service to those making a selection to present the following lists, arranged with reference to securing the greatest variety of effect, and suitable for lawns requiring from one to four dozen species of shrubs and trees, each list being supplementary to the preceding, for grounds of larger extent.

The aim being, in general, to suggest the rarer and newer sorts, several well-known species, like lilac, rose of Sharon, and flowering dogwood, are omitted, with-

out at all underrating their value. It is perhaps needless to add that these rarer species are generally somewhat more expensive, for which there will doubtless be ample compensation in the greater satisfaction derived from a more choice and varied selection, whose beauties of color and form are not reduplicated upon your neighbor's grounds. To the popular name of each species is added its botanical name, color of blossom, and other characteristic features.

FIRST DOZEN

Weeping cut-leaved white birch (Betula alba laciniata pendula)
Weeping beech (Fagus sylvatica pendula)
Forsythia viridissima; yellow; April
Japanese quince; Pyrus japonica; pink to white; early spring
Kerria japonica; yellow; early summer
Deutzia gracilis; white; early summer
Hydrangea paniculata grandiflora; white, then pink; September
Euonymus japonicus; evergreen, glossy
Weigela amabilis; red or white; June
Tamarix africana; pink; May, June
Pieris japonica; white; April, May; evergreen, glossy
Cembra pine (Pinus Cembra)

SECOND DOZEN

Cut-leaved beech (Fagus sylvatica asplenifolia)
Weeping Russian mulberry (Morus tartarica pendula)
Yulan; white; April (Magnolia conspicua)
Magnolia soulangeana; purplish; April
English hawthorn; pink; June (Cratægus oxyacantha flore plena rosea)
Rhododendron; various tints; June
Rosa rugosa; pink; June
Holly-leaved barberry (Mahonia aquifolia)
Cryptomeria japonica; coniferous evergreen

Viburnum plicatum; white; June
Desmodium paniculiflorum; rose-purple; September, October.
Cut-leaved Japanese maple (Acer polymorphum atropurpureum dissectum)

THIRD DOZEN

Cercis chinensis; purplish-pink; May
Clammy locust; rose; July (Robinia viscosa)
Elæagnus longipes; showy fruit
Leucothoë racemosa; white; April, May
Purple-leaved hazel-nut (Corylus avellana atropurpurea)
Daphne mezereum; pink; early spring
Smoke-tree, yellow; June (Rhus cotinus)
Azalea amœna; pink; May
Spiræa Reevesii; white; June
Cut-leaved smooth sumach (Rhus glabra laciniata)
European mountain-ash (Pirus aucuparia var. pendula)
Retinospora ericoides; coniferous evergreen

FOURTH DOZEN

Paulownia imperialis; purple; June.
Silver-bell-tree; white; May (Halesia tetraptera)
Silver fir of Colorado (Abies concolor)
Austrian pine (Pinus austriacus)
Japanese flowering-apple; red; May (Pirus malus floribunda)
Magnolia stellata; white; May
Styrax japonica; white; early summer
Caragana arborescens; yellow; May
Barberry (Berberis Thunbergii)
Purple-leaved maple (Acer pseudo-platanus atropurpurea)
Kœlreuteria; yellow; July, August.
Weigela variegata; pink; May, June; leaves variegated

The selection of vines, which depends so much upon particular requirements, and the facilities for their support, cannot be advised in the same manner as trees

and shrubs. Without interference with the foregoing lists, they can be interspersed according to the conditions of the case. It is by these that the final touch of ornamentation in natural scenery is afforded. Graceful, delicate, artless, and wayward, they seem to symbolize childhood better than all else that grows. A beautiful vine is like a gem of lyric poetry, the consummate expression of nature's tenderness.

The Park contains forty varieties of vines. Besides the ubiquitous wistaria, ampelopsis, and ivy, one will find here and there a hydrangea-leaved vine clinging to the rocks, which we must, perforce, introduce to the reader under the fearful name of *Schizophragma hydrangeoides*, as it comes from abroad and has no popular title. Its strong, glossy leaves finely drape its rocky support, and nothing could be better for covering an extensive wall. It climbs by aërial rootlets like the ivy.

A delicate little herbaceous vine with a curiously shaped compound leaf and violet flowers having three concave petals, is the *Akebia quinata*, from Japan; and from China comes the great-flowered trumpet-flower (*Tecoma grandiflora*), with orange-red bell-shaped flowers three inches across, and showy pinnate leaves. Hardly inferior is our native species (*T. radicans*), which is cultivated abroad.

Here, too, are the best of the clematis species, hailing from Japan and Europe—*flammula*, *lanuginosa*, *paniculata*, *Jackmanni*, and *Henryi*—superb examples of horticultural art, showing most remarkable differences in size, tint, and texture of flowers. The *paniculata* is so hardy, luxuriant, and fragrant that it leaves nothing to

be desired in that type of a vine, while the large purple *Jackmanni* and the immense creamy-white *Henryi* are among the choicest of their kind.

The best of the climbing honeysuckles are here, of course with foreign labels, and of roses, our own prairie rose, with the crimson rambler, yellow rambler, Baltimore Belle, and others from abroad. The omnipresent poison-ivy covers many an oak and maple, adds not a little to the color-effect of autumn, and seems to injure no one. The botanist Gray as a rule is very dispassionate in his discussion of plants, but this one provokes him to unusual ire, and he calls it "a vile pest"! I feel more lenient, and have often stopped to admire its abundant clusters of whitish flowers, its white berries, and the October crimson by which it shows its kinship to the sumachs.

One will find here the bitter-sweet (*Celastrus scandens*), with its orange seeds, and the very different bitter-sweet (*Solanum dulcamara*), with its handsome scarlet berries; the *Lycium*, to all intents a vine, hanging profusely along many a wall, purple-flowered and scarlet-berried; also the huge-leaved pipe-vine (*Aristolochia sipho*), the pink-purple everlasting pea (*Lathyrus latifolia*), periwinkle, periploca, the curious trailing juniper, as much vine as shrub, and many more. The entire catalogue is almost identical with the lists advertised by the foremost florists, and the numerous walls and rockeries, by this elegant ornamentation, become a conspicuous feature of the Park's attraction, especially along the walled subways, and most of all in their endless tints of glorious autumnal coloring.

After the rapid review in which we have glanced at the prominent features of the Park's stately forest growth, its brilliant shrubbery and graceful vines, let me choose for my last allusion that delicate trailing species, the "memorial rose" (*Rosa wichuriana*), that best befits one's retrospective thoughts. Its name is one of the most happily chosen; its five, pure white petals, its dainty leaflets, vivid green, and its trailing habit, afford one of the most charming effects in decoration of a rockery, or to hang over a low wall; a tender-thoughted creature of the soil, that lingers long in memory.

Reviewing the foregoing inventory of trees, shrubs, and vines, we must exclaim, what a wealth of vegetation comes from Japan and China, the land of flowers, a garden of the Lord, that has given us the yulan, the quince, kœlreuteria, forsythia, kerria, deutzia, the best of the azaleas, spiræas, honeysuckles, weigelas—in a word, the choicest of our cultivated plants in nearly every type, particularly of the smaller growths. Discover a species peculiarly elegant, brilliant, or graceful, in flower or foliage, be it tree or shrub, deciduous or evergreen, and you are almost sure to find it labelled "Japonica" or "Chinensis."

BOTANICAL DESCRIPTIONS

The following plant analysis is in six divisions, viz.:

Native and naturalized trees.
Native and naturalized shrubs.
Native and naturalized vines.
Foreign and extra-limital trees.
Foreign and extra-limital shrubs.
Foreign and extra-limital vines.

After each section in the description are the respective leaf-illustrations, showing every leaf whose form is sufficiently characteristic to aid materially in identification. Actual size is not given, this being unnecessary; only the outline and system of venation (the way in which the veins are arranged), the latter being often very distinctive. The further details are found under each leaf's proper number, which is given at the bottom of each plate. The fractions, (½), (⅔), etc., following the proper numbers, mean that the illustrations are one-half, two-thirds, etc., of the average size of the leaves. Only the single leaf (simple or compound) is illustrated, except in case of two or more forms on the same plant, or when the mode of growth on the stem is to be shown.

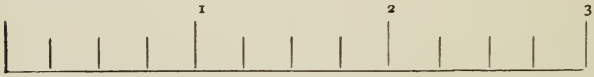
In the Analytical Keys the plants are represented by their proper numbers.

To assist those who wish to learn our trees, shrubs, and vines, but have never studied botany, a brief ac-

count of plant structure is given at the end of the book. With those explanations and a little practice in the use of the Keys, the great majority of the following plants can be easily determined; and even the expert botanist can more quickly identify these three sorts of growth (tree, shrub, and vine) by this method, than by the conventional analysis.

It will be observed that only such details of the blossom as can be seen *without a microscope* (with the single exception of the very minute blossoms of the dodder, of which only one species is widely prevalent in our territory) are referred to throughout this work.

Length in feet and inches is indicated by the signs ° and ′: thus a leaf 3′–6′ is three to six inches long; a shrub 5°–10° is five to ten feet high. Too much stress must not be laid upon a leaf's dimensions, but the figures express the usual limits. The measurement does not include the *stem* in compound leaves, nor in simple leaves when it is very long. p. means polypetalous. m. means monopetalous. These terms are explained under Plant Structure. A scale of inches is often convenient.



Scale of inches.

TREES

Native and naturalized, found in the Northeastern United States (Maine to Virginia, and west to the Mississippi), classified by their **LEAVES.**

A very few of the most familiar cultivated foreign trees, even though not naturalized, are put into this section, to facilitate identification. Those shrubs that are sometimes arboreal are here put in parenthesis, and their descriptions must be looked for under "Shrubs."

ANALYTICAL KEY

Trees not "evergreen" nor cone-bearing (those are 151–170; see below).

Trees not thorny nor prickly (those are 135–150; see below).

LEAVES SIMPLE:

ALTERNATE:

Entire:

widely distributed within territory:

leaves thickish and leathery: 1–5, 63 ("Shrubs," 92, 93)

leaves thin: 6–14

found only on frontier—Virginia, Kentucky, Illinois, or northern part of New England or of New York: 15–19

LEAVES SIMPLE:—*Continued*

ALTERNATE:

Serrate (not lobed):

widely distributed within territory:

leaves roundish: 20–30

leaves ovate, oval, oblong or elliptical: 27–53

leaves slender, including all willows: 53–64, 14

leaves triangular: 65–68

found only on frontier: 69–75, 17–19 ("Shrubs," 72)

Lobed (lobes entire, not serrate nor bristle-pointed): 12, 50, 76–80

Lobed (lobes bristle-pointed, and occasionally with a few scattered teeth): 49, 81–86

Serrate and Lobed (not bristle-pointed): 78, 80, 87–91, 27, 28, 47

OPPOSITE:

Entire: 92–95

Serrate (but not lobed): 96, 97

Serrate and Lobed: 98–103

LEAVES COMPOUND:

PINNATE (or trifoliate):

ALTERNATE:

edge of leaflets entire: 104–108, 115, 134 ("Shrubs," 166)

edge of leaflets serrate:

leaflets few (3–11): 109–114, 119, 134

leaflets many (13–41): 115–121

OPPOSITE: 122–128

PALMATE: 129–133

TREES THORNY OR PRICKLY:

LEAVES SIMPLE: 135–145

LEAVES COMPOUND (PINNATE): 104, 105, 146–150

Trees

EVERGREEN AND CONE-BEARING TREES:

Strictly evergreen, *i.e.*, with foliage the entire year:

leaves 2–5-clustered (*i.e.*, growing from same point on stem), slender, needle-like, 1′–10′ long: 151–158

leaves not clustered, growing from separate points, but very short (½′–¾′):

roundish or 4-angled, stiff, apex sharp: 159–162

flat, pliant: 163–165

leaves *extremely* small ($\frac{1}{16}$′–¼′), scarcely recognizable as leaves, flat and roundish, or awl-shaped and prickly: the branches with the closely appressed (when blunt) leaves forming more or less *flat sprays*: 166–168

Not evergreen, losing all foliage in autumn, but cone-bearing; leaf ½′–1′, either needle-like, or flat and narrow: 169, 170

TREES WITH ORNAMENTAL BLOSSOMS

Native and naturalized in the Northeastern United States.

ANALYTICAL KEY

BLOSSOMS BEFORE OR WITH THE LEAVES:

flowers white: 42, 44, 72, 92, 143
" red: 9, 98
" yellow: 12
" purple: 8

BLOSSOMS AFTER THE LEAVES:

FLOWERS LARGE AND SINGLE (never clustered):

Leaves entire:
crowded at end of branch, flower 6–9-petaled: 7, 16
scattered along branch:
flower entirely or chiefly white, 6–9-petaled: 1, 15
flower greenish-yellow, 6–9-petaled, 6
Leaves lobed and squarish: 76
" serrate, leathery, glossy: 69 (Va.)

FLOWERS CLUSTERED:

TREES THORNY OR PRICKLY:
leaves simple: 135–145
" pinnate: 104, 105, 148

FLOWERS CLUSTERED:—*Continued*

TREES NOT THORNY NOR PRICKLY:

LEAVES SIMPLE, alternate:

flowers white: 10, 20–23, 39, 41, 44, 48, 49 ("Shrubs," 92, 93) (71, 72, Va.)

flowers rosy white: 47 ("Shrubs," 92, 93)

" yellow: 73 (Va.)

LEAVES SIMPLE, opposite: 93, 94, 96, 97

LEAVES PINNATE:

leaflets entire: 104–107

" serrate: 117, 118

LEAVES PALMATE:

flowers white, spotted: 129

" yellow: 130, 131

" purplish: 132

" red: 133

DESCRIPTION OF NATIVE TREES

Native and naturalized, found in the Northeastern United States (Maine to Virginia, and west to the Mississippi), with a very few of the commonest cultivated foreign species.

For definition of terms see pp. 411–424.

1. Small Magnolia. Sweet Bay. (Magnolia glauca.)

LEAF: 4′–6′, simple, alternate, entire, oblong or oval, whitish beneath, thickish, leathery. FLOWER: single, white, fragrant, 2′ broad, sepals 3, petals 6–9, broad; June–August. RANGE: Cape Ann, southward near coast; low tree and shrub. (Pl. VII.)

2. Persimmon. Date-plum. (Diospyros Virginiana.)

LEAF: 4′–6′, simple, alternate, entire, ovate-oblong, thickish, glossy when mature. FLOWER: pistillate and staminate on different trees, corolla pale yellow; June. FRUIT: like plum, 1′ diameter, yellow, edible after frost. RANGE: Rhode Island to Illinois and south.

3. Willow Oak. (Quercus Phellos.)

LEAF: 3′–4′, simple, alternate, entire, narrow, tapering at both ends, thickish, leathery. Acorn small, globular. RANGE: sandy woods, Long Island to Kentucky and south. (Pl. I.)

4. Shingle Oak. Laurel Oak. (Quercus imbricaria.)

LEAF: 4′–6′, simple, alternate, entire, lance-oblong, *glossy* above, downy beneath, thickish, leathery. RANGE: open woodlands, New Jersey to Wisconsin and south. (Pl. I.)

1. Willow Oak. **3.** (2/5)
2. Laurel Oak. **4.** (1/2)
3. Live Oak. **18.** (2/3)
4. Chestnut Oak. **50.** (1/3)
5. Yellow Chestnut Oak. **51.** (2/5)
6. White Oak. **77.** (2/5)

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5. Water Oak. (Quercus aquatica.)

LEAF: 2′–4′, simple, alternate, entire or obscurely 3-lobed, apex obovate, base wedge-shaped, *glossy*, *thick*. RANGE: Maryland and south.

6. Cucumber-tree. Mountain Magnolia. (Magnolia acuminata.)

LEAF: 5′–10′, simple, alternate, entire, oblong, apex pointed, green both sides, thin. FLOWER: 3′–4′ broad, bell-shaped, yellowish-green, single, sepals 3, petals 6–9; May, June. FRUIT: 2′–3′ long, like small cucumber. RANGE: rich woods, New York to Ohio, and south; tallest of magnolias. (Pl. VIII.)

7. Umbrella-tree. (Magnolia tripetala.)

LEAF: 1°–2°, simple, alternate, entire, lance-oblong, apex and base pointed, not thick, many crowded at end of branch in umbrella-form. FLOWER: 8′–10′ broad, white, slight and disagreeable odor, 3 sepals, 6–9 petals; May. RANGE: Pennsylvania to south and west; a low tree. (Pl. VIII.)

8. Papaw. (Asimina triloba.)

LEAF: 8′–12′, simple, alternate, entire, lance-obovate, apex pointed, thin. FLOWER: 1½′ broad, dark purple, single, in spring with leaves. RANGE: west New York to Illinois and south; low tree and shrub. (Pl. VII.)

9. Red-bud. Judas-tree. (Cercis canadensis.)

LEAF: 3′–5′, simple, alternate, entire, roundish, base cordate, apex pointed. FLOWER: small, very numerous, reddish-purple, almost stemless, covering branches before leaves appear, showy, cultivated. RANGE: New York to Illinois and south; low tree and shrub. (Pl. VI.)

10. Alternate-leaved Dogwood. (Cornus alternifolia.)

LEAF: 3′–5′, simple, mostly alternate, entire, oval or ovate, apex tapering, base acute, whitish beneath, crowded at end of branch. FLOWER: small, white, in broad, flat-topped clusters; May, June. FRUIT: blue, berry-like; branch greenish; low tree, oftener shrub.

11. Sour Gum. Tupelo. Pepperidge. (Nyssa sylvatica.)

LEAF: 2′–5′, simple, alternate, entire, oval or obovate, usually sharp-pointed, often slightly angled near apex, *glossy*, crimson in fall. FLOWER: 3–8-clustered on long stem; April, May. FRUIT: berry-like, blue-black, ½′ or less long. RANGE: Massachusetts to Illinois and south. (Pl. VII.)

12. Sassafras. (S. officinale.)

LEAF: 3′–6′, simple, alternate, entire or 2–3-lobed, ovate or oval. FLOWER: small, yellowish, clustered, in spring before or with leaves. FRUIT: blue, ovoid; root, wood and bark spicy. (Pl. V.)

13. Alligator Pear. Red Bay. (Persea Carolinensis.)

LEAF: 4′ or more, simple, alternate, entire, oblong, pale. FLOWER: small, few on a common stem; June. FRUIT: a blue berry. RANGE: Delaware and south, in swamps.

14. Willow. Basket Osier. (Salix viminalis.)

LEAF: 3′–6′, simple, alternate, entire or slightly crenate, very narrow, apex tapering, *lustrous white* and satiny beneath; in wet meadows.

15. Great-leaved Magnolia. (M. macrophylla.)

LEAF: 2°–3°, simple, alternate, entire, obovate-oblong, base tapering and *cordate*, whitish beneath. FLOWER: large, white, base purple-spotted, 6–9 petals 6′ long, slightly fragrant; May, June. Kentucky, planted north. (Pl. VIII.)

16. Ear-leaved Umbrella-tree. (Magnolia Fraseri.)

LEAF: 8′–12′, simple, alternate, entire, auriculate at base, clustered at tip of branch. FLOWER: large, white; April, May. Virginia. (Pl. VIII.)

17. Large Tupelo. (Nyssa uniflora.)

LEAF: 4′–6′, simple, alternate, entire or with few sharp teeth, oblong to ovate, base sometimes cordate, long-stemmed. FLOWER: pistillate *single*; April. FRUIT: blue, 1′ long. Virginia, Kentucky, in water and swamp.

7. Swamp White Oak. **78.** (1/3)
8. Post Oak. **79.** (1/3)

9. Bur Oak. **80.** (1/4)
10. Pin Oak. **81.** (2/5)

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18. Live Oak. (Quercus virens.)

LEAF: 1′–3′, simple, alternate, entire or spiny-toothed, oblong to elliptical, hairy beneath, *evergreen*, leathery; acorn oblong. Virginia. (Pl. I.)

19. Upland Willow-oak. (Quercus cinerea.)

LEAF: much as in 18, but more lance-shaped, and more downy beneath; acorn globular. East Virginia.

20. Linden. Basswood. Lime-tree. (Tilia Americana.)

LEAF: 5′–6′, simple, alternate, sharply serrate, roundish, green and smooth on both sides, base oblique and often slightly cordate. FLOWER: whitish, fragrant, small, clustered and attached to a long, narrow, leaf-like appendage; June. (Pl. IV.)

21. Downy-leaved Basswood. (Tilia pubescens.)

LEAF: 2′–3′, like 20, but smaller, and soft hairy beneath. Maryland, south and west.

22. White Basswood. (Tilia heterophylla.)

LEAF: 6′–7′, like 20, but larger, and whitish beneath. Mountains of Pennsylvania, south and west.

23. European Linden. (Tilia Europæa.)

LEAF: as in 20, but smaller, and generally cordate. FLOWER: lacks the petal-like scales among the stamens found in American species. Cultivated.

24. Common Aspen. (Populus tremuloides.)

LEAF: 1½′–2′, simple, alternate, finely serrate or crenate, roundish or ovate, apex pointed, base cordate, stem thin. Bark yellowish or greenish-white. (Pl. V.)

25. Large-toothed Aspen. (Populus grandidenta.)

LEAF: 3′–4′, simple, alternate, very coarsely serrate with blunt teeth, broad-ovate, young leaves *very white-woolly*, soon becoming smooth; leaf and tree larger than 24, but bark similar. (Pl. V.)

26. Downy Poplar. Swamp Cottonwood. (Populus heterophylla.)

LEAF: 4′–7′, simple, alternate, serrate, broad-ovate, apex blunt, base sometimes cordate, young leaves white-woolly, becoming almost smooth. Branches round. RANGE: west New England to Illinois, and south; swamps. (Pl. V.)

27. Red Mulberry. (Morus rubra.)

LEAF: 3′–6′, simple, alternate, crenate-serrate (sometimes 2–3-lobed), roundish to ovate, base cordate and often oblique, apex pointed, rough above, soft-hairy beneath. FLOWER: in catkin-like spikes. FRUIT: reddish, then purplish, blackberry-like, insipid; July; low tree and shrub.

28. White Mulberry. (Morus alba.)

LEAF: 3′–6′, as in 27, but glossy and smooth above, smooth beneath. FRUIT: whitish; introduced, but becoming spontaneous. (Pl. VII.)

29. Paper Birch. Canoe Birch. (Betula papyrifera.)

LEAF: 3′–5′, simple, alternate, serrate, broad-ovate to oval, apex pointed, base cordate or obtuse. Bark chalky-white; tree much larger than white birch (65). RANGE: New England to Pennsylvania and west. (Pl. IV.)

30. Sea-side Alder. (Alnus maritima.)

LEAF: 2′–4′, simple, alternate, finely serrate, roundish to oblong, thickish. FLOWER: in catkins in September. Delaware and Maryland, near water; low tree and shrub.

31. Sweet Birch. Black Birch. (Betula lenta.)

LEAF: 3′–5′, simple, alternate (often *in pairs*), sharply serrate, ovate to oval, apex pointed, base slightly cordate; trunk-bark dark, smooth, not peeling, but perpendicularly cracking; *twig-bark aromatic*. RANGE: northerly, and along Alleghanies; damp woods. (Pl. IV.)

11. Red Oak. **82.** (1/5)
12. Scarlet Oak. **83.** (1/5)
13. Black Oak. **84.** (1/4)
14. Barren Oak. **85.** (1/4)
15. Spanish Oak. **86.** (1/6)
16. Red Maple. **98.** (1/3)
17. Silver-leaf Maple. **99.** (1/4)
18. Sugar Maple. **100.** (2/5)

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32. Yellow Birch. Gray Birch. (Betula lutea.)

LEAF: almost identical with 31; bark yellowish- or grayish-white, peeling horizontally in *thin* layers, *closely curled.* Twig-bark less aromatic than in Sweet Birch. RANGE: northerly, in damp woods.

33. Red Birch. River Birch. (Betula rubra.)

LEAF: 2′–3′, simple, alternate, doubly-serrate, ovate, base and apex pointed, whitish beneath; bark a little inclined to peel horizontally. RANGE: Massachusetts to Illinois, and south, near water. (Pl. IV.)

34. Hop-Hornbeam. (Ostrya virginiana.)

LEAF: 1′–4′, simple, alternate, serrate, oval, apex tapering (much like elm-leaf, but thin), foliage in flat sprays with *very small* leaves intermingled. FRUIT: white or pinkish, in hop-like clusters; August; bark, with color and texture much as in white oak.

35. Hornbeam. Iron-wood. Water-beech. (Carpinus caroliniana.)

LEAF: almost identical with 34. FLOWER: in catkins. FRUIT: in clusters of small, 3-lobed leaves or bracts, one to each seed; bark, hard, smooth, ashy, *ridged* and *horny;* low tree and shrub, near water. (Pl. VII.)

36. American Elm. White Elm. (Ulmus americana.)

LEAF: 2′–4′, simple, alternate, doubly serrate, oval or obovate, apex pointed, base usually oblique, smooth or slightly rough. FRUIT: roundish, hairy-edged; April, May. Tree vase-shaped, or broad-topped and drooping branches. (Pl. V.)

37. Slippery Elm. (Ulmus fulva.)

LEAF: 4′–8′, as in 36, but much larger and *very rough.* FRUIT: not hairy-edged; April; inner bark mucilaginous. (Pl. V.)

38. Corky White Elm. (Ulmus racemosa.)

LEAF: 2′–4′, about as in 36; branches often corky-ridged. FRUIT: as in 36, but larger; April, May; near water.

39. Wild Black Cherry. Rum Cherry. (Prunus serotina.)

LEAF: 2′–5′, simple, alternate, serrate, lance-oblong, apex tapering, glossy above. FLOWER: white, in long clusters, *after* the leaves; June. FRUIT: purplish-black; bark ragged; tree and shrub. (Pl. IX.)

40. Beech. (Fagus ferruginea.)

LEAF: 4′–6′, simple, alternate, serrate, oblong, apex tapering, border slightly "fulled." FRUIT: prickly. Branches long, slender, horizontal; bark light-ashy. (Pl. VI.)

41. Chestnut. (Castanea sativa, var. americana.)

LEAF: 4′–12′, simple, alternate, serrate (teeth incurved), lance-oblong, apex pointed. FLOWER: whitish, in long abundant catkins; June, July; bark perpendicularly light-streaked. (Pl. IV.)

42. June-berry. Shad-bush. (Amelanchier canadensis.)

LEAF: 2′–3′, simple, alternate, finely serrate, oblong (broadly or narrowly). FLOWER: white, in short or long clusters, just after leaves have started; April, May. FRUIT: globular, red or purplish, sweet, ripe in June; low tree and shrub. (Pl. VIII.)

43. Nettle-tree. Hackberry. Sugarberry. (Celtis occidentalis.)

LEAF: 2′–4′, simple, alternate, serrate, ovate, *markedly tapering*, base *oblique* and sometimes cordate. FRUIT: purple, size of very small cherry; bark peculiarly warty on lower trunk; Middle States and rarely east. (Pl. X.)

44. Wild Red Cherry. (Prunus pennsylvanica.)

LEAF: 3′–5′, simple, alternate, *finely* serrate, lance-oblong, apex pointed, rather *glossy*. FLOWER: white, in rather large lateral clusters, long stemmed; May, when leaves are half-grown. FRUIT: very small, light red.

45. Balsam Poplar. (Populus balsamifera.)

LEAF: 3′–6′, simple, alternate, serrate, ovate, apex tapering, *smooth*, leathery, lighter beneath; *buds fragrant*. RANGE; northern New England to Wisconsin, and north. (Pl. VI.)

19. Striped Maple. **101.** (1/5)
20. Mountain Maple. **102.** (1/4)
21. Cut-leaved Maple. **103.** (1/4)
22. Ash-leaved Maple. **122.** (1/4)
23. Chestnut. **41.** (1/5)
24. American Linden. **20.** (1/4)
25. Paper Birch. **29.** (1/8)
26. White Birch. **65.** (1/3)
27. Red Birch. **33.** (1/4)
28. Sweet Birch. **31.** (1/4)

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46. Balm of Gilead. (Populus balsamifera, var. candicans.)

LEAF: 3′–6′, much like 45, but broader, base cordate, and young leaves and stems hairy. RANGE of 45. (Pl. VI.)

47. Wild Apple. Crab Apple. (Pyrus coronaria.)

LEAF: 3′–4′, simple, alternate, coarsely serrate (and sometimes lobed), ovate, base occasionally cordate. FLOWER: rather large, rosy, fragrant, few in cluster; May. RANGE: west New York to Wisconsin, and south; small tree and shrub. The "narrow-leaved crab apple," with narrower leaf generally serrate, and styles *entirely* distinct, from Pennsylvania southward, is probably a variety of the above. (Pl. X.)

48. Sour-wood. Sorrel-tree. (Oxydendrum arboreum.)

LEAF: 4′–7′, simple, alternate, finely serrate, lance-oblong, apex pointed. FLOWER: white (corolla 5-toothed), in long compound terminal clusters; June, July. RANGE: Pennsylvania and Ohio, and south.

49. American Holly. (Ilex opaca.)

LEAF: 2′–4′, simple, alternate, serrate with spiny teeth (or with bristle-pointed lobes), oval, thick, evergreen, glossy. FLOWER: white, sessile, in small clusters along branches; June; berries red. RANGE: Maine to Pennsylvania, near coast; tree and shrub. (Pl. X.)

50. Chestnut Oak. (Quercus prinus.)

LEAF: 4′–12′, simple, alternate, coarsely crenate or numerously small-lobed, oblong or slightly obovate. More abundant to the south. (Pl. I.)

51. Yellow Chestnut Oak. (Quercus Muhlenbergii.)

LEAF: 4′–8′, simple, alternate, coarsely toothed, oblong to elliptical, apex usually pointed; the form of chestnut leaf, but with a slender stem. (Pl. I.)

52. Chinquapin. (Chestnut.) (Castanea pumila.)

LEAF: 3′–5′, simple, alternate, serrate, oblong or elliptical, apex sharp, whitish beneath. Nut *single* in bur, ½ size of chestnut. RANGE: So. Pennsylvania to Ohio, and south; low tree and shrub.

53. Shining Willow. (Salix lucida.)

LEAF: 3′–5′, simple, alternate, serrate, long-ovate to lance-shaped, apex tapering, leathery when mature, *glossy;* near water; tree and shrub. (Pl. X.)

54. Peach Willow. (Salix amygdaloides.)

LEAF: 2′–3′, simple, alternate, serrate, lance-shaped, often curved, apex very tapering, base wedge-shaped or rounded, glossy above, whitish beneath; more to the south and west. (Pl. XI.)

55. Glaucous Willow. Pussy Willow. (Salix discolor.)

LEAF: 3′–5′, simple, alternate, serrate on sides, entire at base and apex, lance-shaped to oblong, apex sharp, whitish bloom beneath on older leaves; near water; low tree and shrub. (Pl. XI.)

56. Purple Willow. (Salix purpurea.)

LEAF: 3′–6′, simple, alternate, finely but sparingly serrate, reverse lance-shaped, apex pointed; smooth; twigs reddish or olive-tinted; low tree; low grounds.

57. Heart-leaved Willow. (Salix cordata.)

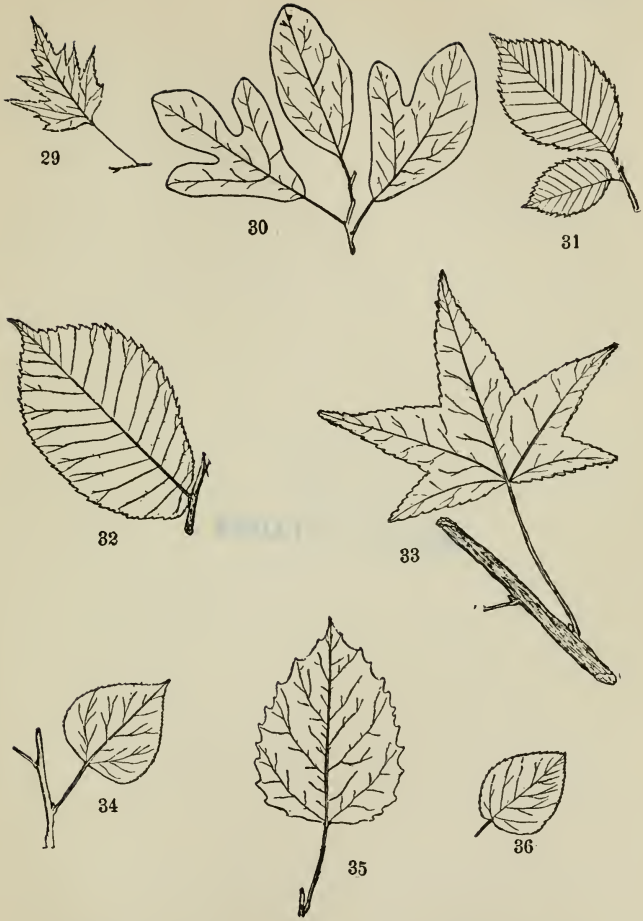
LEAF: 2½′–6′, simple, alternate, serrate, lanceolate, apex tapering, smooth, paler beneath, base not always cordate. Catkins with 4–5 minute leaves at base, before or with leaves; May, June; low tree and shrub.

58. Black Willow. (Salix nigra.)

LEAF: 3′–6′, simple, alternate, serrate, narrow, tapering, base pointed, both sides green and smooth; bark dark and rough; southerly along streams.

59. Brittle Willow. Crack Willow. (Salix fragilis.)

LEAF: 5′–6′, simple, alternate, serrate, narrow, tapering at both ends, dark and smooth; 2 warts on leaf stem; branches shining, greenish, very brittle; tall foreign tree.



29. Cut-leaved Birch. **90.** (1/3)
30. Sassafras. **12.** (1/5)
31. American Elm. **36.** (1/3)
32. Slippery Elm. **37.** (1/4)
33. Sweet Gum. **87.** (1/3)
34. Common Aspen. **24.** (2/5)
35. Large-toothed Aspen. **25.** (1/3)
36. Downy-leaved Poplar. **26.** (1/5)

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60. White Willow. Yellow Willow. (Salix alba, with var. vitellina.)

LEAF: 3′–4′, simple, alternate, serrate, narrow, apex tapering, white silky hairy both sides, more beneath. The willow seen in early spring with bright yellow branches is a variety (vitellina) with shorter, broader leaves.

61. Weeping Willow. (Salix Babylonica.)

LEAF: 5′, simple, alternate, serrate, long and narrow; tree recognized by long, drooping branches. (Pl. X.)

62. Long-leaved Willow. Sandbar Willow. (Salix longifolia.)

LEAF: 2′–6′, simple, alternate, minutely serrate, ⅛′–½′ broad, very silky when young; along river-banks; low tree and shrub

63. Bebb Willow. Long-beaked Willow. (Salix rostrata.)

LEAF: 2′–4′, simple, alternate, quite or scarcely serrate, or entire, long-obovate, apex sharp, base wedge-shaped or rounded, when mature thick, dull green above, quite downy beneath; twigs usually reddish-brown; tree and shrub.

64. Scythe-leaved Willow. (Salix nigra, var. falcata.)

LEAF: 4′–8′, simple, alternate, finely serrate, very narrow, apex and base tapering, often curved, both sides green and smooth; stipules *persistent*, crescent-shaped, *serrate*. RANGE: New England to Pennsylvania and west; low tree and shrub.

65. White Birch. Gray Birch. (Betula populifolia.)

LEAF: 2′–3′, simple, alternate, doubly serrate, triangular, apex long-pointed, rather glossy; bark white, but not peeling as readily as in Paper Birch. RANGE: Maine to Pennsylvania, near coast. (Pl. IV.)

66. Cottonwood. River Poplar. (Populus monilifera.)

LEAF: 2′–5′, simple, alternate, rather coarsely serrate, triangular, apex tapering; small branches somewhat angled. RANGE: west New England to Illinois, and south; stately tree; near water. (Pl. VI.)

67. Angled Cottonwood. (Populus angulata.)

LEAF: 2′–6′, simple, alternate, serrate, triangular, base sometimes cordate; branches sharply angled or winged. RANGE: Pennsylvania to Wisconsin and south; perhaps only a variety of 66.

68. Lombardy Poplar. (Populus dilatata.)

LEAF: 2′, simple, alternate, serrate, very triangular; tree tall and very slender from the almost vertical direction of branches; introduced from Europe. (Pl. VI.)

69. Loblolly Bay. (Gordonia Lasianthus.)

LEAF: 2′–3′, simple, alternate, finely serrate, lance-oblong, base tapering, *leathery*, *glossy*. FLOWER: white, large, single, 5-petaled, on axillary stems; May–July. Virginia, swamps; low tree and shrub.

70. Alder-buckthorn. (Frangula Caroliniana.)

LEAF: 3′–5′, simple, alternate, very finely serrate, oblong. FLOWER: small, greenish, clustered or single; calyx-lobes, petals and stamens each 5. Virginia and west; said to be locally in New Jersey; small thornless tree and shrub.

71. White Alder. Sweet Pepperbush. (Clethra acuminata.)

LEAF: 5′–7′, simple, alternate, finely serrate, oval or oblong, apex sharp, pale beneath, thin. FLOWER: small, white, in long drooping racemes; July. Virginia; low tree and shrub.

72. Silver-bell-tree. Halesia. (H. tetraptera.)

LEAF: 4′–6′, simple, alternate, minutely serrate, long-ovate, apex tapering. FLOWER: showy, white, bell-shaped, in long chimes, covering tree when the leaves are slightly grown; May. FRUIT: 1½′ long, 4-winged. Virginia; tree and shrub. (Pl. X.)

73. Sweet-leaf. Horse-sugar. (Symplocos tinctoria.)

LEAF: 3′–5′, simple, alternate, finely serrate, long-oblong, apex sharp, thickish, pale beneath, sweet. FLOWER: small, yellow, fragrant (petals 5), 6–14 in cluster; April. Virginia; tree and shrub.

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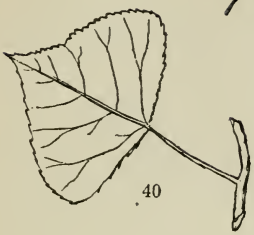

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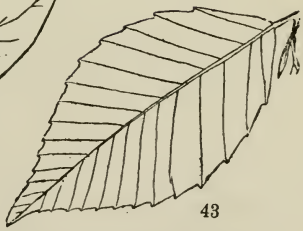

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37. Balsam Poplar. **45.** (1/4)
38. Balm of Gilead. **46.** (1/5)
39. Cottonwood. **66.** (1/4)
40. Lombardy Poplar. **68.** (1/2)
41. Silver-leaf Poplar. **89.** (2/3)
42. Red Bud. **9.** (1/2)
43. American Beech. **40.** (2/5)

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74. Winged Elm. Whahoo. (Ulmus alata.)

LEAF: 1′–2½′, simple, alternate, serrate, short-lance-shaped, thickish, downy beneath; some of the branches fringed with corky wings. FLOWERS in March. Virginia and west.

75. Planer-tree. (Planera aquatica.)

LEAF: as in elm, 36; difference in fruit, which is 1- instead of 2-celled, nut-like, and not winged. FLOWERS in April. Kentucky.

76. Tulip-tree. Yellow Poplar. (Liriodendron tulipifera.)

LEAF: 5′–6′, simple, alternate, lobed, squarish. FLOWER: large, tulip-shaped, greenish-yellow and orange, petals 6, 2′ long; May, June. FRUIT: persistent all winter, tulip-shaped. RANGE: south New England to Illinois, and south; tall, cylindrical. (Pl. VII.)

77. White Oak. (Quercus alba.)

LEAF: 5′–9′, simple, alternate, about 7 (deeply)-lobed, *not bristle-pointed nor serrate;* bark ashy-white. (Pl. I.)

78. Swamp White Oak. (Quercus bicolor.)

LEAF: 5′–6′, simple, alternate, many-lobed (not as deeply as 77), sometimes *coarsely* toothed near apex, irregular, *whitish-downy beneath, not bristle-pointed;* bark ashy-white. (Pl. II.)

79. Post Oak. Rough White Oak. (Quercus minor.)

LEAF: 5′–8′, simple, alternate, strongly few-lobed, variable but rather cruciform, rough above, thick, leathery, grayish beneath. (Pl. II.)

80. Bur Oak. Mossy-cup Oak. (Quercus macrocarpa.)

LEAF: 6′–12′, simple, alternate, 5–7 (large)-lobed, most of the lobes again small-lobed or very coarsely serrate; lobes often large at base, small at top; when mature leathery, thick, glossy above, and lighter, often rusty, beneath; cup thick, covered with scales that form a fringed border. RANGE: west New England to Wisconsin and Kentucky. (Pl. II.)

81. Pin Oak. Swamp Spanish Oak. (Quercus palustris.)

LEAF: 4′–6′, simple, alternate, 5–7 (deeply)-lobed, lobes with a few scattering teeth and bristle-pointed, glossy when mature; much like that of scarlet oak, but smaller; swamps and low ground. (Pl. II.)

82. Red Oak. (Quercus rubra.)

LEAF: 5′–9′, simple, alternate, 7–11-lobed, lobes with a few scattering teeth and bristle-pointed, when mature dark green and sometimes glossy. (Pl. III.)

83. Scarlet Oak. (Quercus coccinea.)

LEAF: 5′–9′, simple, alternate, 5–7 (deeply)-lobed, lobes with a few scattering teeth and bristle-pointed, very glossy when mature. (Pl. III.)

84. Black Oak. (Quercus coccinea, var. tinctoria.)

LEAF: 5′–8′, simple, alternate, 7–9-lobed, with a few scattering teeth, and bristly points; quite variable forms on the same tree, but generally with a heavier appearance, and less deeply lobed than other oak leaves; considered by Gray a variety, not a species; nearest like red oak. (Pl. III.)

85. Barren Oak. Black Jack. (Quercus nigra.)

LEAF: 5′–9′, simple, alternate, usually 3-lobed at broad top (lobes bristle-pointed), narrowed at base, when mature thick, leathery, and glossy above, lighter and scurfy beneath. RANGE: New York to Illinois and south. (Pl. III.)

86. Spanish Oak. (Quercus cuneata.)

LEAF: 6′–7′, simple, alternate, either 3-lobed only at apex, or 5–7-lobed throughout, the main ones slender and often curved, and all with bristly points, perhaps a little serrate; dark, glossy above when mature; rare north, abundant south. (Pl. III.)

87. Sweet Gum. Bilsted. Liquidamber. (L. styraciflua.)

LEAF: 3′–6′, simple, alternate, serrate and usually 5-lobed, lobes pointed, rather glossy, aromatic when bruised. FRUIT: hard, globular aggregation covered with sharp points, hanging into the winter; *branches generally corky-ridged.* RANGE: Connecticut to Illinois, and south. (Pl. V.)

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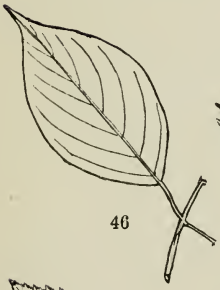

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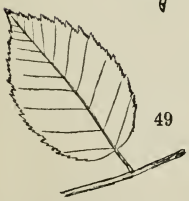

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44. Buttonwood. **88.** (1/4)
45. Tulip-tree. **76.** (1/3)
46. Flowering Dogwood. **92.** (1/3)
47. Sour Gum. **11.** (1/3)
48. Mulberry. **28.** (1/4)
49. Hornbeam. **35.** (1/3)
50. Papaw. **8.** (1/6)
51. Sweet Bay. **1.** (1/3)

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88. Buttonwood. Buttonball. Plane-tree. (Platanus occidentalis.)

LEAF : 4′–9′, simple, alternate, coarsely serrate, 3–5-lobed, lobes pointed, general form almost circular. FRUIT : in soft globular masses hanging through winter ; bark peels off in irregular patches leaving trunk whitish or yellowish. (Pl. VII.)

89. Silver-leaf Poplar. White Poplar. (Populus alba.)

LEAF : 2′–3′, simple, alternate, coarsely serrate and 3–5-lobed, ovate, *cottony-white beneath;* trunk below dark and rough, above whitish, resembling white birch ; introduced but quite common. (Pl. VI.)

90. Cut-leaved Birch. (Betula alba laciniata.)

LEAF : 2′–3′, simple, alternate, serrate and lobed, triangular, a variety of the white birch, the weeping cut-leaved birch being the most beautiful. (Pl. V.)

91. Cut-leaved Beech. (Fagus sylvatica asplenifolia.)

LEAF : 3′–4′, simple, alternate, *lobed, with a few coarse teeth*, narrow-ovate, base wedge-shaped, apex pointed, otherwise like the common beech (40) ; introduced. (Pl. I. Foreign trees.)

92. Flowering Dogwood. (Cornus florida.)

LEAF : 3′–5′, simple, opposite, entire, ovate, apex taper-pointed, base a little narrowed, veins beneath *curving* toward apex. FLOWER : greenish-yellow, small, clustered, each cluster surrounded by four large, petal-like, white or pinkish bracts, the whole apparently forming *one* flower, before the leaves ; April, May ; a variety has the " flower " a deep pink. FRUIT : bright red berries, showy in fall ; low tree and shrub. (Pl. VII.)

93. Fringe-tree. (Chionanthus virginica.)

LEAF : 4′–8′, simple, opposite, entire, oval or oblong, dark green. FLOWER : white, in long, loose axillary clusters ; petals 4–6, long-linear ; delicate and ornamental inflorescence ; June ; south Pennsylvania and south ; low tree and shrub ; cultivated.

94. Catalpa. Indian Bean. (Catalpa bignonoides.)

LEAF: 6′–10′, simple, opposite (or in threes), entire, roundish, apex pointed, base cordate, downy beneath. FLOWER: ornamental, white, violet-tinged, yellow- and purple-spotted, in loose clusters; July; pods 8′–12′ long, narrow, on the tree all winter. Possibly in Illinois; widely cultivated. (Pl. IX.)

95. Devil-wood. (Olea americana.)

LEAF: 3′–6′, simple, opposite, entire, oblong-lance-shaped, *glossy*, *leathery*. FLOWER: small, white, clustered; corolla bell-shaped with 4-parted spreading border; May; coast of south Virginia; low tree.

96. Black Haw. Stag Bush. (Viburnum prunifolium.)

LEAF: 1½′–2′, simple, opposite, finely serrate, oval, apex blunt or slightly pointed; stem slightly winged. FLOWER: small, white (corolla 5-lobed), in large, flat-topped clusters; May. FRUIT: berry-like, blue-black, sweet and edible after frost. RANGE: Connecticut to Illinois, and south; low tree and shrub. (Pl. IX.)

97. Sheep-berry. Sweet Viburnum. (V. lentago.)

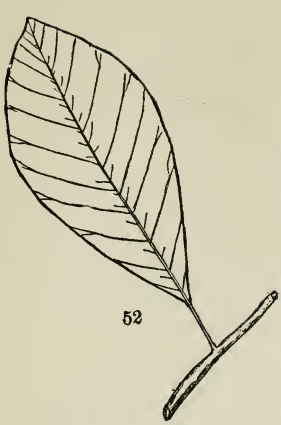
LEAF: 2′–4′, simple, opposite, sharply serrate, ovate, sharply pointed; stem slightly winged. FLOWER: as in 96; May, June. FRUIT: blue-black, oval, ½′ long, sweet; more common northward; low tree.

98. Red Maple. Swamp or Soft Maple. (Acer rubrum.)

LEAF: 3′–6′, simple, opposite, serrate, 3–5-lobed (palmately), slightly whitish beneath. FLOWER: usually red, in small clusters, in early spring before leaves; leaf-stem, twig, and fruit red or reddish; earliest to blossom of all our ornamental flowering trees. FRUIT: winged seeds, *in pairs*, *as in all maples*. (Pl. III.)

99. Silver-leaf Maple. White Maple. (Acer dasycarpum.)

LEAF: 5′–7′, simple, opposite, serrate, *deeply* 5-lobed, when mature silvery-white beneath. FLOWER: inconspicuous, yellowish-green, before leaves. (Pl. III.)



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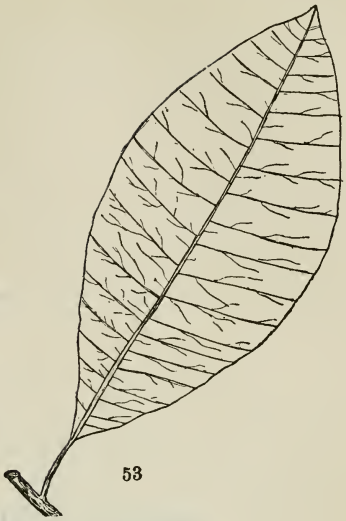

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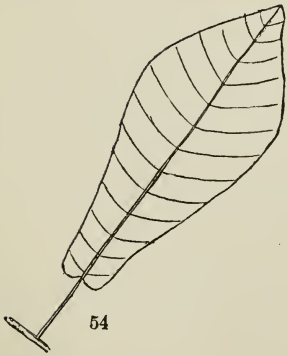

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52. Cucumber tree. **6.** ($^1/_4$)
53. Umbrella-tree. **7.** ($^1/_4$)
54. Great-leaved Magnolia. **15.** ($^1/_{12}$)
55. Ear-leaved Magnolia. **16.** ($^1/_6$)
56. Shad-bush. **42.** ($^1/_3$)

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100. Sugar Maple. Rock Maple. (Acer saccharinum.)

LEAF: 3′–6′, simple, opposite, sparingly serrate, 3–5 main lobes, other smaller ones, each main lobe tapering into a long *blunt* point. FLOWER: small, greenish-yellow, clustered, developing with the leaves; April, May; more northerly, and in mountains southerly. (Pl. III.)

101. Striped Maple. Moosewood. (Acer pennsylvanicum.)

LEAF: 3′–7′, simple, opposite, *closely* serrate, 3-lobed *near apex*, *very broad*. FLOWER: greenish, in long drooping racemes, *after* leaves are out; June. RANGE: Maine to Wisconsin and south, especially in mountains; bark with dark longitudinal stripes; low tree and shrub. (Pl. IV.)

102. Mountain Maple. (Acer spicatum.)

LEAF: 3′–5′, simple, opposite, serrate, 3- (or slightly 5-) lobed, lobes generally very tapering, downy beneath, lighter green than striped maple, with which it is frequently growing. FLOWER: greenish, in *erect* racemes that droop in ripening; June. RANGE: Maine to Wisconsin, and south, especially in mountains; low tree and oftener a shrub. (Pl. IV.)

103. Cut-leaved Maple. (Acer wierii laciniatum.)

LEAF: 3′–7′, simple, opposite, *very deeply* and *numerously* lobed (5 main lobes, each with secondary lobes and coarse teeth), whitish beneath; flower and fruit as in other maples; cultivated variety. (Pl. IV.)

104. Locust. Acacia. Black or Yellow Locust. (Robinia pseudacacia.)

LEAF: 8′–14′, odd-pinnate, alternate; leaflets, 7–25, 1′–2′ long, oblong or ovate, entire, distinctly stemmed. FLOWER: white, sweet-pea-shaped, in dense drooping racemes, fragrant; early June. Pod, 3′–4′ long, hanging all winter; bark rough, trunk and branches *often prickly*, especially in the younger growth. RANGE: Pennsylvania to Illinois, and south; widely cultivated. (Pl. XI.)

105. Clammy Locust. (Robinia viscosa.)

LEAF: 5′–12′, odd-pinnate, alternate; leaflets, 11–21, 1½′–2′ long, oblong or ovate, entire, apex mucronate, stemmed. FLOWER: rosy-white, sweet-pea-shaped, in dense clusters, slightly fragrant, middle of June; leaf-stems and branchlets *sticky*. Virginia; widely cultivated; low tree and shrub; *sometimes prickly*.

106. Yellow-wood. (Cladrastis tinctoria.)

LEAF: 10′–16′, odd-pinnate, alternate; leaflets, 7–11, 4′–6′ long, entire, oval or ovate, end-leaflet larger. FLOWER: white, sweet-pea-shaped, in long, showy terminal racemes; June; smooth bark. Kentucky; cultivated. (Pl. XI.)

107. Kentucky Coffee-tree. Stump-tree. (Gymnocladus canadensis.)

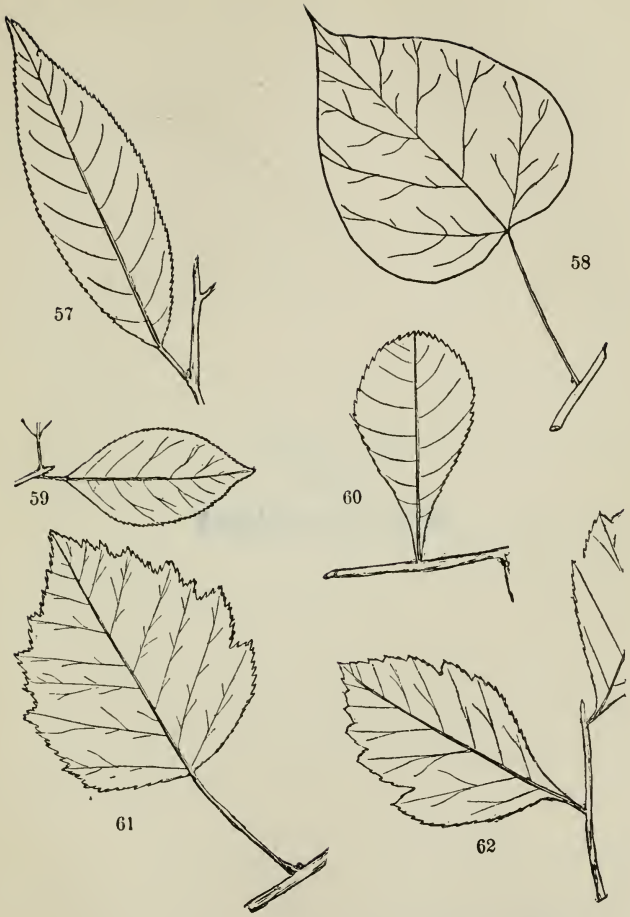
LEAF: 1°–3°, doubly pinnate, alternate; leaflets (on each partial leaf-stem), 6–12, about 2′ long, entire, ovate; a pair or two of simple leaflets at base. FLOWER: greenish-white, small; the staminate in clusters 3′–4′ long, the pistillate clusters 10′–12′ long; June; pod, 6′–10′ long. RANGE: west New York to Illinois, and southwest, but rare; cultivated. (Pl. XIII.)

108. Poison Sumach. Poison Dogwood. (Rhus venenata.)

LEAF: 7′–14′, odd-pinnate, alternate; leaflets, 7–13, 2′–4′ long, entire, oblong or obovate, apex sharp or slightly tapering. FLOWER: greenish-white, or yellowish-green, small, in loose clusters; June. FRUIT: white berries; swamps; low tree, oftener a shrub; very poisonous. (Pl. XII.)

109. Shagbark Hickory. Shellbark Hickory. (Hicoria ovata.)

LEAF: 6′–18′, odd-pinnate, alternate; leaflets, always 5, end one largest with stem, other 4 almost or quite stemless, lowest pair *much smaller*, all finely serrate, lance-oblong or lance-obovate, apex tapering, roughish below; stem rough; bark peeling in longitudinal strips, but clinging to trunk; 4-valved husk *very thick* (½″); only valuable hickory-nut, except pecan-nut. (Pl. XI.)



57. Wild Black Cherry. **39.** (1/2)
58. Catalpa. **94.** (1/4)
59. Black Haw. **96.** (2/3)
60. Cockspur Thorn. **135.** (1/2)
61. White Thorn. **136.** (2/3)
62. Black Thorn. **137.** (1/2)

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110. Mocker-nut. Black Hickory. Big-bud Hickory. (Hicoria alba.)

LEAF: 8′–12′, odd-pinnate, alternate; leaflets, 7–9, 2′–7′ long, serrate, stemless except the terminal, lance-obovate, apex pointed, scented when crushed; stem *rough throughout;* husk thinner than in shagbark (about ¼′); buds very large. RANGE: eastern and southern part of territory. (Pl. XII.)

111. Pignut. Broom Hickory. (Hicoria glabra.)

LEAF: 8′–12′, odd-pinnate, alternate; leaflets, 5–7, seldom 9, 2′–5′ long, lowest pair smallest, serrate, lance-obovate or lance-oblong, apex pointed, stemless (except the terminal), leaf and main stem *smooth;* husk *thin;* nut pear-shaped or round, *smooth.*

112. Bitternut. Swamp Hickory. (Hicoria minima.)

LEAF: 6′–10′, odd-pinnate, alternate; leaflets, 7–11, 3′–6′ long, serrate, long-oval or long ovate, apex tapering, smooth when mature; stem usually slightly winged and flattened; husk very thin, nutshell thin, kernel very bitter.

113. Western Shagbark Hickory. (Hicoria sulcata.)

LEAF: much as in the eastern shagbark (109), but leaflets 7–9; bark exfoliating, husk even thicker than in 109, and nut larger. RANGE: Pennsylvania to Wisconsin, and south.

114. Small-fruited Hickory. (Hicoria microcarpa.)

LEAF: 6′–10′, odd-pinnate, alternate; leaflets, 5 (rarely 7), 2′–5′ long, serrate, lowest pair smallest, elliptical, base and apex pointed. FRUIT: as in shagbark, but smaller, husk thinner. RANGE: New York to Pennsylvania, and southwest; probably a variety of pignut.

115. Ailanthus. (A. glandulosus.)

LEAF: 1½°–3°, odd-pinnate, alternate; leaflets, 21–41, 3′–5′ long, one or two teeth at base on each side (rarely none), lance-oblong. FLOWER: yellowish-green, small, in dense upright clusters (staminate malodorous); June. FRUIT: winged seeds; introduced, but now spontaneous. (Pl. XIII.)

116. Staghorn Sumach. Velvet Sumach. (Rhus typhina.)

LEAF: 1⅓°–2°, odd-pinnate, alternate; leaflets, 11–31, 2′–5′ long, serrate, lance-oblong, apex pointed; leaf-stems and branchlets thickly and *velvety hairy*. FLOWER: greenish-white or greenish-red, small, in dense erect pyramidal clusters; June. FRUIT: dry crimson berries densely clustered and showy in fall; low tree and shrub. (Pl. XII.)

117. American Mountain Ash. (Pyrus americana.)

LEAF: 6′–10′, odd-pinnate, alternate; leaflets, 13–17, 2′–3′ long, sharply serrate, lance-oblong, apex pointed, dark green above. FLOWER: white, in large, flat-topped clusters; June. FRUIT: bright red berries. RANGE: Maine to Pennsylvania, west and south; low tree and shrub; cultivated. (Pl. XIII.)

118. European Mountain Ash. (Pyrus aucuparia.)

LEAF: much as in 117, but leaflets *oblong*, apex *blunt*, dull green above, downy beneath; berries *larger;* cultivated.

119. Butternut. White Walnut. (Juglans cinerea.)

LEAF: 1°–2½°, odd-pinnate, alternate; leaflets, 11–17, 3′–5′ long, serrate, lance-oblong, apex tapering, base rounded, downy; stem, branchlets, and fruit *sticky-hairy*. FLOWER: small, staminate in catkins 3′–5′ long, pistillate in spikes, ⅓′ long. May. FRUIT: oblong; bark, light brownish.

120. Black Walnut. (Juglans nigra.)

LEAF: 1°–2°, odd-pinnate, alternate; leaflets, 13–23, 2′–4′ long, serrate; much as in 119, but base often oblique or cordate, and smooth; stem and *globular* fruit not sticky; bark quite dark; scarce in Eastern States except when planted. (Pl. XIII.)

121. Pecan-nut. (HICKORY.) (Juglans olivæformis.)

LEAF: 1°–2°, odd-pinnate, alternate; leaflets, 13–15, 2′–5′ long, serrate, lance-oblong, apex very tapering, short-stemmed, slightly scythe-shaped. FLOWERS in catkins. FRUIT: oblong; husk four-valved, as in all hickories. Illinois and south.

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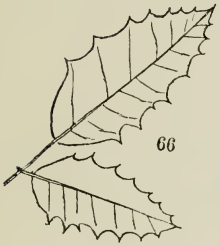

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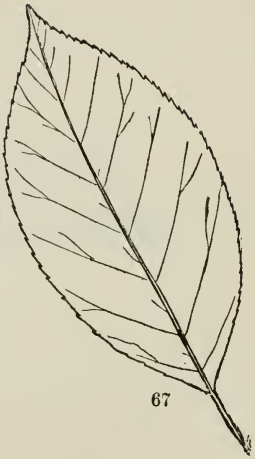

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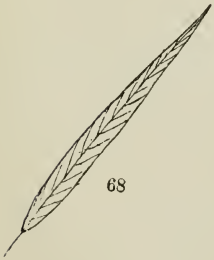

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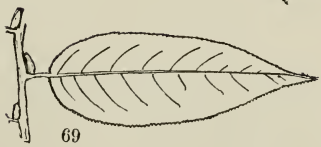

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63. English Hawthorn. **140.** (1/2)
64. Nettle-tree. **43.** (1/2)
65. Wild Apple. **47.** (1/4)
66. American Holly. **49.** (1/2)
67. Silver-bell-tree. **72.** (2/3)
68. Weeping Willow. **61.** (1/3)
69. Shining Willow. **53.** (1/3)

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122. Ash-leaved Maple. Box-elder. (Negundo aceroides.)

LEAF: odd-pinnate, opposite; leaflets, 3–5 (rarely 7), 2′–4′ long, unequally and coarsely serrate (the terminal quite often lobed), ovate, apex sharp. FLOWER: small, greenish, before or with leaves in drooping clusters; April, May. FRUIT: winged seeds as in maple. RANGE: Pennsylvania to Wisconsin, and south. Cultivated. (Pl. IV.)

123. White Ash. (Fraxinus americana.)

LEAF: 8′–12′, odd-pinnate, opposite; leaflets, 5–9, 3′–5′ long, minutely serrate or entire, ovate to lance-oblong, apex pointed, dull above, lighter beneath, *with distinct stem.* FLOWER: inconspicuous, clustered; April, May. FRUIT: seeds long-winged *from apex;* leaf-stalks and branchlets smooth. (Pl. XII.)

124. Red Ash. (Fraxinus pubescens.)

LEAF: 10′–12′, odd-pinnate, opposite; leaflets, 7–9, 3′–5′ long, finely serrate or entire, ovate to lance-oblong, apex tapering, short-stemmed; leaf-stalks and branchlets *thickly soft-hairy.* FLOWER: inconspicuous; May. FRUIT: seed margined and with long wing from apex. Commoner eastward.

125. Black Ash. Water Ash. (Fraxinus sambucifolia.)

LEAF: 10′–15′, odd-pinnate, opposite; leaflets, 7–11 (rarely 13), 3′–5′ long, serrate, lance-oblong, apex tapering, *stemless* (except the end one), *dark green*, smooth throughout; crushed, smells like elder. FLOWER: inconspicuous; May. FRUIT: seed margined all around with long wing; *buds blackish.* (Pl. XII.)

126. Green Ash. (Fraxinus viridis.)

LEAF: 10′–12′, odd-pinnate, opposite; leaflets, 5–9, 3′–5′ long, serrate, oval, apex tapering, *both* sides bright green, smooth throughout, *stemmed;* bud grayish-brown. FRUIT: seed margined all around, with long wing at apex; possibly only a variety of red ash.

127. Blue Ash. (Fraxinus quadrangulata.)

LEAF: 8′–12′, odd-pinnate, opposite; leaflets, 5–9, 3′–5′ long, serrate, ovate or oval, apex tapering, both sides green, *very* short-stemmed. FRUIT: narrow-oblong, *apex often notched*, seed winged all around; differs from green ash in having a calyx; branchlets 4-angled; inner bark yields a blue dye. Quite westerly.

128. Carolina Water Ash. (Fraxinus platycarpa.)

LEAF: 8′–10′, odd-pinnate, opposite; leaflets, 5–7, 3′–5′ long, slightly serrate, ovate to oblong, both ends pointed, short-stemmed. FRUIT: oblong, broadly winged. Virginia, near water.

129. Horse-chestnut. (Æsculus hippocastanum.)

LEAF: 5′–7′, palmate, opposite; leaflets, 7, serrate, obovate-oblong, apex pointed. FLOWER: white, yellow-and-purple-spotted, in pyramidal clusters; late in May. Young fruit prickly. Introduced from China, but widely cultivated. (Pl. XIII.)

130. Ohio Buckeye. Fetid Buckeye. (Æsculus glabra.)

LEAF: 5′–9′, palmate, opposite; leaflets, 5 (rarely 7), serrate, obovate-oblong to oval, apex pointed. FLOWER: pale yellow, small, in pyramidal clusters, stamens longer than petals; June; young fruit prickly. RANGE: west Pennsylvania, south and west; a small tree. (Pl. XIV.)

131. Sweet Buckeye. Big Buckeye. (Æsculus flava.)

LEAF: 5′–9′, palmate, opposite; leaflets, 5–7, long-obovate to long-oval, apex pointed. FLOWER: yellow, in pyramidal clusters, stamens no longer than petals, April, May; fruit not prickly. RANGE: Pennsylvania, south and west; tree and shrub.

132. Purplish Buckeye. (Æsculus flava, var. purpurascens.)

LEAF: as in 130. FLOWER as in 130, but corolla and calyx purplish; fruit smooth. West Virginia and south; tree and shrub.

133. Red Buckeye. (Æsculus pavia.)

LEAF: much as in 130. FLOWER as in 130, but corolla and longer tubular calyx bright red, stamens not longer than corolla, May; fruit smooth. Virginia and Kentucky; tree and shrub.

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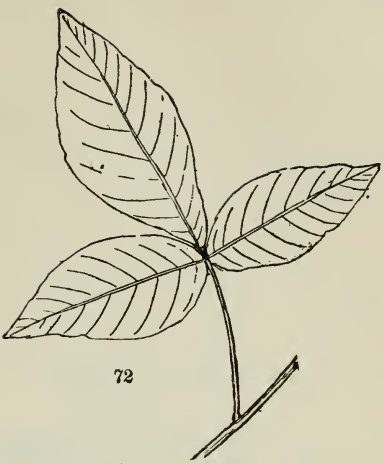

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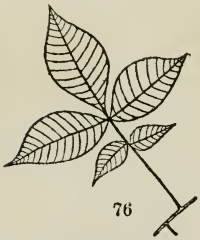

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70. Peach Willow. **54.** ($^1/_2$)
71. Pussy Willow. **55.** ($^1/_5$)
72. Hop-tree. **134.** ($^1/_2$)
73. Yellow-wood. **106.** ($^1/_{10}$)
74. Common Locust. **104.** ($^1/_{10}$)
75. Honey-locust. **146.** ($^1/_{12}$)
76. Shagbark Hickory. **109.** ($^1/_{12}$)

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134. Hop-tree. Wafer Ash. Shrubby Trefoil. (Ptelea trifoliata.)

LEAF: 3′–5′, trifoliate, alternate; leaflets, 3, entire, ovate or long-ovate, apex pointed, base of the terminal one tapering. FLOWER: small, greenish-white, in compound clusters, ill-scented; June. FRUIT: roundish, winged all around, often white and ornamental in September. RANGE: Pennsylvania to Wisconsin, and south; low tree and shrub. (Pl. XI.)

135. Cockspur Thorn. (Cratægus crus-galli.)

LEAF: 2′–3′, simple, alternate, serrate toward apex, obovate, base wedge-shaped *tapering to a point*, stemless, *thick*, *glossy*. FLOWER: white, 5-petalled, clustered; June. FRUIT: globular, red, ⅓′ diameter; thorns long; low tree and shrub. (Pl. IX.)

136. White Thorn. Scarlet-fruited Thorn. (Cratægus coccinea.)

LEAF: 2′–5′, simple, alternate, doubly serrate, or with small lobes, round-ovate, stem slender; entirely smooth. FLOWER: white or rosy-tinged, in large clusters; May. FRUIT: bright red, ovoid, ½′ across, hardly edible; low tree and shrub; thorny. (Pl. IX.)

137. Black Thorn. Pear Thorn. (Cratægus tomentosa.)

LEAF: 3′–5′, simple, alternate, doubly serrate or even somewhat lobed, oval to ovate, stem somewhat margined; *thickish*, and apt to be downy beneath. FLOWER: white, clustered; May, June. FRUIT: orange or scarlet, ½′ diameter; low tree and shrub; thorny. (Pl. IX.)

138. Dotted Haw. (Cratægus punctata.)

LEAF: 2′–3′, simple, alternate, unequally serrate toward apex, obovate, base strongly wedge-shaped and entire, *tapering into winged stems*, thickish. FLOWER: white, clustered; May, June. FRUIT: yellowish-red, whitish-dotted; low tree and shrub; thorny.

139. Downy-leaved Hawthorn. (Cratægus mollis.)

LEAF: essentially as in 137 (of which it is probably a variety), but rounder, and downy when young; fruit larger. Illinois and Michigan; low tree and shrub; thorny.

140. English Hawthorn. (Cratægus oxyacantha.)

LEAF: 1½–3′, simple, alternate, obovate, base wedge-shaped, serrate and lobed. FLOWER: white, rosy, or red, clustered, in May. FRUIT: small, red; introduced, but now slightly spontaneous; not so thorny as native species; low tree and shrub. (Pl. X.)

141. Washington Thorn. (Cratægus cordata.)

LEAF: 3′–5′, simple, alternate, serrate, often 3–5-lobed, triangular, or broad-ovate, base often a little cordate, thinnish, stem slender. FLOWER: white, clustered; June. FRUIT: red, very small. Virginia and west; low tree and shrub; thorny.

142. Summer Thorn. Summer Haw. (Cratægus flava.)

LEAF: 3′–5′, simple, alternate, unequally serrate and slightly lobed toward apex, obovate, base wedge-shaped and entire, thin. FLOWER: white, in small (2–6) clusters; May. FRUIT: reddish, juicy, large. Virginia, low tree and shrub; thorny.

143. Wild Yellow or Red Plum. (Prunus americana.)

LEAF: 2′–3′, simple, alternate, rather coarsely sharp-serrate, oval to slightly obovate, apex tapering. FLOWER: white, in small side-clusters, in early spring, before or with the leaves. FRUIT: orange, yellow or red, ½″–⅗″ diameter; low tree, more or less thorny.

144. Southern Buckthorn. (Bumelia lycioides.)

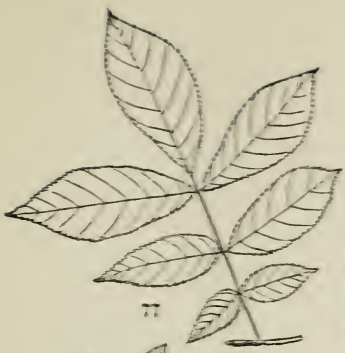
LEAF: 2′–4′, simple, alternate, entire, short lance-shaped, base tapering. FLOWER: small, white, in dense clusters; May, June. Kentucky, Illinois; low, thorny tree.

145. Western Buckthorn. (Bumelia lanuginosa.)

LEAF: 1½″–3′, simple, alternate, entire, obovate, base wedge-shaped, rusty-woolly beneath. FLOWER: small, white, 6–12-clustered; July. Illinois; low, thorny tree.

146. Honey-locust. Three-thorned Acacia. (Gleditschia triacanthos.)

LEAF: 6–8, pinnate and doubly pinnate, alternate; leaflets, 10–24, 1′–2′ long (when once pinnate; when twice pinnate, much smaller, and very numerous), entire, or very obscurely serrate.



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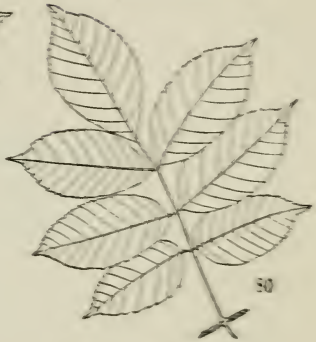

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77. Mockernut (Hickory). 110. (1/8)
78. Staghorn Sumach. 116. (1/14)
79. Poison Sumach. 108. (1/8)

80. White Ash. 123. (1/8)
81. Black Ash. 125. (1/8)
82. Prickly Ash. 140. (1/8)

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long-oval, apex rounded; thorns large, often branched and clustered on trunk and branches; bark dark, smooth. FLOWER: small, greenish, in small dense clusters; June. FRUIT: a pod, 8′–18′ long, clinging through winter. Pennsylvania, west and south; cultivated. (Pl. XI.)

147. Water-locust. (Gleditschia monosperma.)

LEAF: as in 146, but leaflet ovate or oblong, thorns more slender, pod *oval, with one seed.* Illinois; low tree.

148. Angelica-tree. Hercules' Club. Devil's Walking-stick. (Aralia spinosa.)

LEAF: 2°–3°, twice pinnate, alternate, crowded; leaflets, 2′–3′ long, ovate, serrate, apex pointed; trunk club-shaped, little-branched, beset with stout spines. FLOWER: small, whitish, in very long, erect, compound clusters; July, August. Pennsylvania to Kentucky; low tree and shrub; cultivated. (Pl. XIII.)

149. Prickly Ash. Toothache Tree. (Zanthoxylum americanum.)

LEAF: 1° or more, odd-pinnate, alternate; leaflets, 5–11, 2′–3′ long, almost or quite entire, long-oval, base and apex pointed, downy when young, stemless, with lemon odor when crushed; branches and sometimes leaf-stalk prickly. FLOWER: small, greenish, in side-clusters before leaves; low tree (in cultivation) and shrub. (Pl. XII.)

150. Prickly Ash. (Southern.) (Zanthoxylum carolinianum.)

LEAF: 1° or more, odd-pinnate, alternate; leaflets, 7–11, 2′–3′, ovate or lance-ovate, base oblique, *glossy.* FLOWER: small, greenish-white, in *terminal* clusters, *after* the leaves; June. Coast of Virginia; low prickly tree and shrub.

151. White Pine. Weymouth Pine. (Pinus strobus.)

LEAF: 3′–5′, slender, soft, 5-clustered. CONE: 4′–6′ (longest of all except of Norway spruce), often curved. (Pl. XIV.)

152. Pitch Pine. (Pinus rigida.)

LEAF: 3′–5′, rather stiff, *dark green*, 3-clustered. CONE: 1′–3½′, often clustered, the scales having short, stout, recurved prickles at apex. Eastern States. (Pl. XIV.)

153. Red Pine. (Pinus resinosa.)

LEAF: 4′–6′, rather stiff, dark green, 2-clustered. CONE: 2′ or more in length, without prickles at apex of scales. Pennsylvania to Wisconsin, and south. (Pl. XIV.)

154. Yellow Pine. Spruce Pine. (Pinus mitis.)

LEAF: 3′–5′, dark green, slender, 2- and 3-clustered. CONE: about 2′ long, with small, weak prickles at apex of scales. Southern New York, south and west. (Pl. XIV.)

155. Loblolly Pine. Old-field Pine. (Pinus tæda.)

LEAF: 6′–10′, light green, 3-clustered. CONE: 3′–5′, stiff-prickly on scales. New Jersey, and south.

156. Jersey Pine. Scrub Pine. (Pinus virginiana.)

LEAF: 1½′–3′, vivid green, twisted, 2-clustered. CONE: 1′–3′, usually somewhat curved, scales prickly. New Jersey to Kentucky, and south.

157. Northern Scrub Pine. Gray Pine. (Pinus banksiana.)

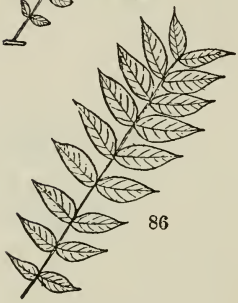
LEAF: 1′, curved, stiff, 2-clustered. CONE: 1½′–2′, commonly curved; scales not prickly. Northern frontier; low tree and shrub.

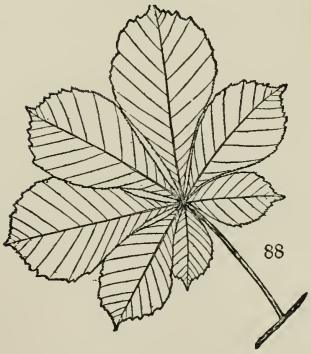
158. Table Mountain Pine. (Pinus pungens.)

LEAF: 1½′–2½′, stiff, bluish, 2-(occasionally 3-)clustered. CONE: 3½′, clustered, scales stout-prickly. Pennsylvania, and south along Alleghany Mountains.

159. White Spruce. (Picea canadensis.)

LEAF: ½′–¾′, 4-angled, apex sharp, pale green or with white bloom, growing from all sides of branch. CONE: cylindrical, about 2′ long, *not hanging over winter*, scales entire at apex. Northern frontier. (Pl. XIV.)





83. Mountain Ash. **117.** ($^1/_5$)
84. Kentucky Coffee-tree. **107.** ($^1/_{15}$)
85. Angelica-tree. **148.** ($^1/_{16}$)
86. Black Walnut. **120.** ($^1/_{12}$)
87. Ailanthus. **115.** ($^1/_{16}$)
88. Horse-chestnut. **129.** ($^1/_5$)

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160. Black Spruce. (Picea mariana.)

LEAF: ⅓′–¾′, 4-angled, apex sharp, dark green or with white bloom, growing from all sides of branch. CONE: oval or long-ovate, 1′–1½′ long, *hanging two or three years;* scales with upper edge often slightly eroded. Northern New England and New York, and along the Alleghanies.

161. Red Spruce. (Picea rubens.)

LEAF: ½′–¾′, 4-angled, apex sharp, dark glossy green when mature, growing from all sides of branch. CONE: 1¼′–2′, long-ovate, *not hanging over winter;* a little more southerly than black spruce, of which it is perhaps a variety.

162. Norway Spruce. (Picea excelsa.)

LEAF: much as in white spruce (159), but tree identified by conspicuous *drooping of branchlets*, especially in older trees, and by great length of cones (4′–6′); introduced, but becoming spontaneous.

163. Hemlock. Hemlock Spruce. (Tsuga canadensis.)

LEAF: about ½′, *flat*, apex rounded, pliant, mostly 2-ranked, *i.e.*, growing on two opposite sides of branch. CONE: ½′–¾′, oval, remains through one winter; commonest northward. (Pl. XV.)

164. Balsam Fir. Balm of Gilead Fir. (Abies balsamea.)

LEAF: ½′–1′, *flat*, apex usually pointed, pliant, *not* 2-*ranked*, as in hemlock. CONE: 2′–4′, cylindrical, *erect* on branch (in other evergreens it *droops*); trunk thickly blistered, exuding an aromatic gum. South to Pennsylvania, and along Alleghanies; prefers damp woods.

165. Southern Balsam Fir. (Abies fraseri.)

LEAF: as in 164; chief difference in the cone, which is only 1′–2′ long, and long-ovate. Mountains of Pennsylvania and Virginia.

166. Arborvitæ (White Cedar). (Thuya occidentalis.)

Leaf : extremely small (scarcely ⅛′ long), scale-like, closely appressed to stem, roundish or ovate ; branches growing in *flattened, fan-like sprays;* aromatic when crushed. Cone : about ½′ long, oval to roundish, 6–10 scales, seeds broad-winged. Pennsylvania and northward ; near water. (Pl. XV.)

167. Cypress. White Cedar. (Chamæcyparis thyoides.)

Leaf : much as in 166, but smaller, dull green, sharp-pointed or ovate, and "sprays" much more delicate. Cone : lobular, ¼′ diameter. Maine, southward along coast. (Pl. XV.)

168. Red Cedar. Savin. (Juniperus virginiana.)

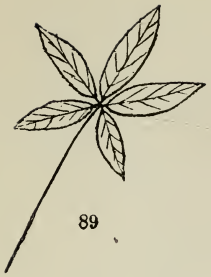
Leaf : of two forms : flat and closely appressed to branch, as in arborvitæ (but smaller, $\frac{1}{16}'$ long), or awl-shaped, very sharp-pointed, prickly and divergent from branch, ¼′ long ; in vigorous tree-branches and in shrubs it is mostly of the latter sort ; in older growth, of the former ; dark green. Conf : berry-shaped, ¼′–⅓′ diameter, blackish with white bloom ; tall, spiry tree, and shrub.

169. Larch. Tamarack. Hackmatack. (Larix americana.)

Leaf : 1′, more or less, needle-like, in *fascicled* clusters, *i.e.*, so crowded as to appear in a dense cluster or whorl ; in early spring ; deciduous ; bright green when young. Cone : ½′–¾′. Pennsylvania to Wisconsin, and north. The European larch, which is the one usually cultivated, has *longer leaves and cones.* (Pl. XV.)

170. Bald Cypress. (Taxodium distichum.)

Leaf : ½′–¾′, *narrow*, flat, thin, 2-ranked, late in May, deciduous, *as are also some of the branchlets.* Cone : globular, 1′ diameter. Delaware to southern Illinois, and south ; planted north. (Pl. XV.)



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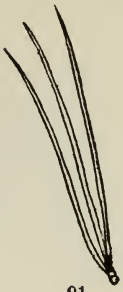

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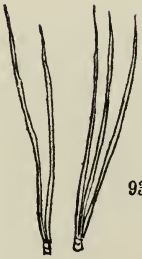

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89. Ohio Buckeye. **130.** ($^1/_{10}$)
90. White Pine. **151.** ($^2/_3$)
91. Pitch Pine. **152.** ($^1/_3$)
92. Red Pine. **153.** ($^1/_3$)
93. Yellow Pine. **154.** ($^1/_3$)
94. Spruce. **159.** ($^2/_3$)

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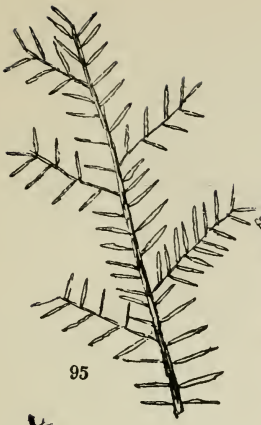

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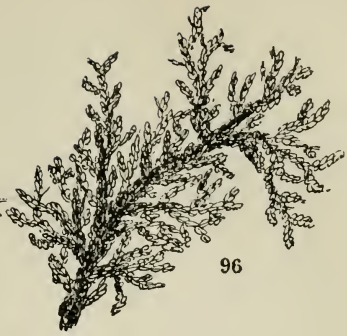

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95. Hemlock. **163.** (1/2)
96. Arborvitæ. **166.** (1/2)
97. Larch. **169.** (1/4)
98. White Cedar. **167.** (1/2)
99. Bald Cypress. **170.** (1/4)

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SHRUBS

Native and naturalized, found in the Northeastern United States (Maine to Virginia, and west to the Mississippi), classified by their **BLOSSOMS**.

ANALYTICAL KEY

Shrubs not "evergreen" nor cone-bearing (those are 194–197; see below).

Shrubs whose blossoms are not in the form of catkins, or catkin-like spikes, as in the chestnut, oak, etc. (those are 167–193; see below).

GROUP I.—Blossoms White or Cream-white

Section I.—Blossoms **polypetalous,** i.e., *with petals entirely distinct from each other.*

Shrubs not thorny nor prickly (those are 39–48; see below); widely distributed in territory (*at least not limited to the frontier States of our prescribed area*):

blossoms *before* or *with* the leaves: 1–3
("Trees," 42)

blossoms *after* the leaves:

LEAVES SIMPLE:

ALTERNATE:

Entire: 4, 5, 26, 94 ("Trees," 1, 10)
Serrate (but not lobed): 5–17, 105 ("Trees," 39, 49)
Serrate and Lobed: 18–21

Opposite:

Entire: 22–26 ("Trees," 92, 93)
Serrate: 27, 28

LEAVES COMPOUND:

PINNATE (or trifoliate): 29, 165, 166 ("Trees," 116–118, 134) ("Vines," 2)

found only on frontier:

LEAVES SIMPLE:

ALTERNATE: 30–34 ("Trees," 69, 71)
OPPOSITE: 35–38

SHRUBS THORNY OR PRICKLY (throughout area):
thorny: 39–42, 3, ("Trees," 135–142, 148)
prickly: 43–48

SECTION II.—Blossoms (white) **monopetalous,** i.e., *with petals more or less united in one piece:*

widely distributed in territory:

LEAVES SIMPLE:

ALTERNATE:

Entire: 49–56, 92, 93, 97, 99–102
Serrate: 50, 51, 56, 57, 13–17 ("Trees," 49)

OPPOSITE (or whorled):

Entire: 58–61, 65, 93, 112, 135 ("Trees," 93)
Serrate (but not lobed): 58, 62–66 ("Trees," 96)
Serrate and Lobed: 67, 68

LEAVES COMPOUND:

PINNATE: 69, 70

found only on frontier:

in Virginia: 30, 30[a], 32–34, 71–82 ("Trees," 72)
on northern edge: 83–89

SECTION III.—Blossoms (white or reddish) **apetalous,** i.e., *with no corolla:* 90, 91, 102, 164

GROUP II. — Blossoms Rosy-white to Red and Crimson

LEAVES SIMPLE:

Alternate:

Entire: 92–103, 49–51, 53 ("Trees," 9)

Serrate or Lobed: 100, 104–107, 7, 8, 10, 50, 51 ("Trees," 47, 136, 140)

Opposite (or whorled):

Entire: 93, 103, 108–112 (89, White Mountains) ("Trees," 92)

Serrate or Lobed: 108–110, 28

LEAVES COMPOUND:

Pinnate (or trifoliate): 113–117, 47, 48, 165, 166 ("Trees," 105, 116)

Palmate: ("Trees," 133)

GROUP III.—Blossoms Yellow (or Yellowish)

LEAVES SIMPLE:

Alternate:

Entire: 118–124, 56 (76, Virginia)

Serrate or wavy edged: 125–127, 56 (76, Virginia), ("Trees," 73)

Opposite:

Entire:

leaves black-dotted: 128–132

leaves not dotted: 118, 119, 133–138 ("Trees," 92)

Serrate: 138, 139

LEAVES COMPOUND:

Pinnate (or trifoliate): 140, 141 ("Trees," 108)

Palmate: ("Trees," 131)

GROUP IV.—Blossoms Purplish, Blue or Dark

LEAVES SIMPLE:

Alternate:

Entire: 142–147, 97, 99–102 ("Trees," 8, 9)

Serrate: 10, 100, 101, 107

LEAVES SIMPLE:—*Continued*

OPPOSITE (or whorled):
Entire: 148–150, 61
Serrate: 151, 152

LEAVES COMPOUND:

PINNATE: 153–155
PALMATE: ("Trees," 132)

GROUP V. — BLOSSOMS GREENISH, OR GREENISH-WHITE, ALWAYS DIMINUTIVE

LEAVES SIMPLE:

ALTERNATE:
Entire: 5, 146, 147, 156
Serrate (but not lobed): 5, 13–17, 157–159 (32–34, Virginia) ("Trees," 70)
Serrate and Lobed: 19–21, 160–163

OPPOSITE:
Entire: 65, 90, 164
Serrate: 65, 152, 164 ("Trees," 101, 102)

LEAVES COMPOUND:
PINNATE (or trifoliate): 165, 166 ("Trees," 108, 116, 134, 149, 150) ("Vines," 2)

SHRUBS WITH BLOSSOMS IN CATKINS OR CATKIN-LIKE SPIKES:
leaves fragrant when crushed: 167–169
leaves not fragrant when crushed:
widely distributed:
leaves roundish to elliptical, not willow-like: 170–178 ("Trees," 27, 30, 35)
leaves willow-like: 179–187 ("Trees," 53, 57, 63, 64)
only on northern frontier: 188–193

"EVERGREEN" SHRUBS: 194–197 ("Trees," 157, 168)

SHRUBS

Native and naturalized, within prescribed territory, classified by their **LEAVES.**

Shrubs not "evergreen" nor cone-bearing (for those, see below).

Shrubs not thorny nor prickly (for those, see below), *widely distributed*—at least not limited to the frontier States of our area.

ANALYTICAL KEY

LEAVES SIMPLE:

ALTERNATE (or close-clustered):

Entire: 4, 5, 26, 49–56, 92–102, 118–121, 123, 144, 146, 147, 156, 168 (willows, 181–183, 186) ("Trees," 1, 8, 9, 10, 63)

Serrate or wavy-edged (not lobed): 1–3, 5–17, 50, 51, 56, 57, 100, 105, 107, 127, 158, 159, 167, 168, 170–176, 178 (willows, 179–181, 184, 185, 187) ("Trees," 27, 30, 35, 39, 42, 47, 49, 53, 57, 63, 64)

Lobed (not serrate): 169, 176, 177 ("Trees," 49)

Serrate and Lobed: 18–21, 104, 106 ("Trees," 27, 47)

OPPOSITE (or whorled):

Entire: 22–26, 58–61, 65, 90, 93, 102, 108, 109, 111, 112, 118, 119, 128–131, 133, 134, 137, 148, 149 ("Trees," 92, 93)

Serrate (not lobed): 27, 28, 58, 62–66, 139, 151, 152 ("Trees," 96)

Lobed (not serrate): 108, 109

Serrate and Lobed: 67, 68 ("Trees," 101, 102)

LEAVES COMPOUND:

PINNATE (or trifoliate):

ALTERNATE:

leaflets entire: 141, 153, 166 ("Trees," 108, 134) ("Vines," 2)

leaflets serrate (or lobed): 140, 155, 165, 166 ("Trees," 116–118) ("Vines," 2)

OPPOSITE:

leaflets serrate: 29, 69, 70

PALMATE: ("Trees," 131)

found only on frontier of prescribed area:

LEAVES SIMPLE:

ALTERNATE:

Entire: (on northern frontier: 84, 88, 98, 142, 145, 189, 193) (in Virginia, 33, 76, 103, 122, 124, 143) (Southern Illinois, 75)

Serrate: (on northern frontier: 85–87, 188–192) (in Virginia, 30, 32–34, 72–74, 76–81, 91) (Michigan, 31) (Southern Illinois, 75) ("Trees," 69–73)

OPPOSITE:

Entire: (on northern frontier: 89, 132, 135, 136) (in Virginia, 35, 36, 38, 71, 103, 138, 150) (in Illinois, 37, 110, 164)

Serrate or Lobed: (on northern edge: 83) (in Virginia, 35, 36, 71, 82, 138) (in Illinois, 110, 164)

LEAVES COMPOUND:

PINNATE: (in Virginia, 117) (in Michigan and Wisconsin, 154) ("Trees," 105)

PALMATE: ("Trees," 132, 133)

Description of Native Shrubs

SHRUBS THORNY OR PRICKLY:

widely distributed in area:

thorny:

leaves simple, alternate (or closely clustered): 3, 39, 40, 125, 157 ("Trees," 135–138, 140)

leaves compound: ("Trees," 148, 149)

prickly:

leaves simple, alternate: 160–163

leaves compound, pinnate, or trifoliate: 43–47, 113–116

found only on frontier:

thorny:

leaves simple, alternate (or closely clustered): 41, 42, 126 ("Trees," 139, 141, 142)

leaves compound, pinnate: ("Trees," 105, 150)

prickly:

leaves compound, pinnate or trifoliate, 48

SHRUBS "EVERGREEN" OR CONE-BEARING:

194–197 ("Trees," 157, 168)

DESCRIPTION OF NATIVE SHRUBS

Native and naturalized, found in the Northeastern United States (Maine to Virginia, and west to the Mississippi).

For definition of terms see pp. 411–424.

1. Beach Plum. (Prunus maritima.)

LEAF: 1′–3′, simple, alternate, finely serrate, ovate to oval, downy beneath. FLOWER: p., white (petals 5), in small lateral umbels, before or with the leaves. FRUIT: globular, ½′–1′ in diameter, crimson or purple, with bloom. RANGE: Maine to Virginia, near coast; 2°–5° high. (Pl. I.)

2. Dwarf Cherry. (Prunus pumila.)

LEAF: 1′–2′, simple, alternate, serrate near apex, narrow-obovate, base tapering. FLOWER: p., white (petals 5), in small lateral umbels, before or with leaves. FRUIT: ovoid, dark red. RANGE: Massachusetts, west and south; ½°–3° high. (Pl. I.)

3. Chickasaw Plum. (Prunus Chicasa.)

LEAF: 1′–2′, simple, alternate, finely serrate, lance-shaped. FLOWER: p., white (petals 5), in small lateral umbels, before or with leaves. FRUIT: globular, red, ½′–⅔′ in diameter. RANGE: Maryland to Illinois, and southwest; 6°–12° high, rarely thorny.

4. Labrador Tea. (Ledum latifolium.)

LEAF: 1′–2′, simple, alternate, entire, oblong to elliptical, rusty-woolly beneath, edge rolled under. FLOWER: p., white (petals 5), small, in terminal clusters of about 12; June. RANGE: New England to Pennsylvania, and northwest; 2°–5° high. (Pl. I.)

5. Mountain Holly. (Nemopanthes mucronata.)

LEAF: 1′–2′, simple, alternate, entire or slightly serrate, oblong, smooth, stem slender. FLOWER: p., white or greenish-white, small (petals 4–5, spreading, narrow), commonly single, on long stems; May, June. FRUIT: red, large as peas. Commoner northward; 4°–8° high.

6. New Jersey Tea. (Ceanothus Americanus.)

LEAF: ¾′–3′, simple, alternate, serrate, ovate, base often cordate. FLOWER: p., white (petals 5 and hooded), calyx and flower-stem white, in long, dense clusters. July; root dark red; 1°–3° high. (Pl. I.)

7. Common Meadow-sweet. (Spiræa salicifolia.)

LEAF: 1½′–3′, simple, alternate, serrate, lance-shaped, base tapering, *almost smooth*. FLOWER: p., white or rosy, minute, in erect dense clusters; July; low shrub. (Pl. I.)

8. Birch-leaved Spiræa. (S. corymbosa.)

LEAF: 1′–2′, simple, alternate, serrate *near apex*, oval to ovate, smoothish. FLOWER: as in 7, but in large *flat* clusters; June. Mountains of Pennsylvania and Virginia, and west; low. (Pl. I.)

9. Choke-cherry. (Prunus virginiana.)

LEAF: 2′–3′, simple, alternate, finely serrate, oval or obovate, *apex abruptly pointed*, thin. FLOWER: p., white (petals 5, roundish), crowded in rather long terminal clusters; May; fruit dark red; commoner northward; tall. (Pl. I.)

10. Choke-berry. (Pyrus arbutifolia.)

LEAF: 2′–3′, simple, alternate, finely serrate, obovate or oblong. FLOWER: p., white, reddish, or purplish (petals 5), usually 10–12-clustered; May, June; fruit red, purple, or black; damp places; 2°–10° high.

11. White Alder. Sweet Pepperbush. (Clethra alnifolia.)

LEAF: 2′–3′, simple, alternate, serrate (entire toward base), wedge-obovate, both sides green. FLOWER: p., white, fragrant

(petals 5), in erect spike-like clusters, rather showy, 10 stamens; July, August. RANGE: Maine to Virginia, wet places near coast; 3°–10° high.

12. Itea. (I. virginica.)

LEAF: 2′–3′, simple, alternate, finely serrate, oblong or oval, apex sharp, short-stemmed. FLOWER: p., white (petals 5, lance-shaped, much longer than calyx), small, in spike-like clusters; June. New Jersey and south; wet places near coast; 6° high.

13. Mountain Ilex. (I. montana.)

LEAF: 3′–5′, simple, alternate, serrate, ovate to elliptical, apex tapering, smooth. FLOWER: p. and m., white or greenish-white, small (petals and stamens 4–6, sepals hairy-fringed), single or *few*-clustered; May. FRUIT: red or purple. RANGE: Pennsylvania and south along mountains, locally in New York.

14. Soft Ilex. (I. mollis.)

LEAF: as in 13, but *downy* beneath. FLOWER: as in 13, but the staminate in *large* clusters; May. Locally in Pennsylvania, and south in mountains.

15. Winterberry. Black Alder. (Ilex verticillata.)

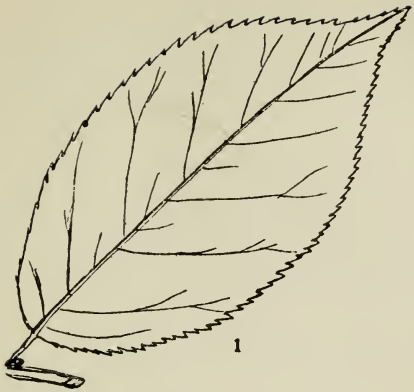
LEAF: 2′–3′, simple, alternate, serrate, obovate to wedge—lance-shaped, base and apex pointed, veins beneath *downy*. FLOWER: as in 13, and almost stemless; May, June; fruit bright red. (Pl. II.)

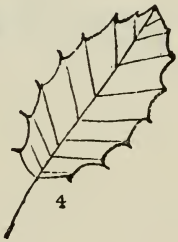
16. Smooth Winterberry. (I. lævigata.)

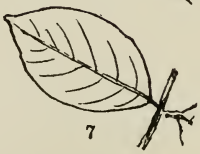
LEAF: as in 13, but rather glossy above, smooth beneath. FLOWER: as in 13, but the staminate on long stems; fruit bright red; near water.

17. Inkberry. (Ilex glabra.)

LEAF: 1′–2′, simple, alternate, serrate *toward apex*, oblong, base wedge-shaped, *glossy above*, *leathery*. FLOWER: as in 13, but stems ½′ long; June. FRUIT: black, shining. Massachusetts to Virginia, near coast; 2°–3° high. (Pl. II.)







1. Cherry and Plum Type. **1**, etc.
2. New Jersey Tea. **6.** (av. size)
3. Labrador Tea. **4.** (av. size)
4. American Holly. (Trees, **49.**) (1/2)
5. Meadow Sweet. **7.** (2/3)
6. Birch-leaved Spiræa. **8.** (2/3)
7. Snowberry. **109.** (2/3)

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18. Ninebark. (Physocarpus opulifolius.)

LEAF: 1½′–3′, simple, alternate, serrate and three-lobed, roundish, base cordate. FLOWER: p., white (petals 5), small, in roundish clusters; June; *bark peeling in long strips of many thin layers.* Var. *aurea* (cultivated) has yellow variegation in foliage. (Pl. II.)

19. Wild Black Currant. (Ribes floridum.)

LEAF: 1′–2′, simple, alternate, serrate, 3–5-sharply-lobed, base slightly cordate, *sprinkled with resinous dots.* FLOWER: p., whitish or greenish, rather large (petals and stamens 5) in drooping many-flowered clusters; calyx long-bell-shaped. May; fruit black. (Pl. II.)

20. Wild Red Currant. (Ribes rubrum.)

LEAF: 1′–2′, simple, alternate, serrate, 3–5-bluntly-lobed, base cordate; veins whitish beneath. FLOWER: as in 19, *but from buds distinct from leaf-buds;* calyx flat. May, June; fruit red; New Hampshire, and west; straggling. (Pl. II.)

21. Fetid Currant. (Ribes prostratum.)

LEAF: as in 19, but base *deeply* cordate, and not resinous-dotted. FLOWER: as in 19, but clusters *erect*, calyx flattish; May. FRUIT: pale red and (with the stems) *bristly;* bruised herbage and berries malodorous. New England, New York, and Pennsylvania.

22. Round-leaved Dogwood. (Cornus circinata.)

LEAF: 3′–5′, simple, opposite, entire, roundish to oval, apex pointed, woolly beneath. FLOWER: p., white, small (petals 4), in large flat clusters. June; fruit light blue; branch greenish with warty spots; 6°–10° high. (Pl. II.)

23. Silky Dogwood. Kinnikinnik. (Cornus sericea.)

LEAF: 2′–4′, simple, opposite, entire, narrow ovate to elliptical, apex pointed, dull green, downy beneath, *as also branchlets and flower-stalks;* branches purplish. FLOWER: as in 22, but clusters smaller. June; fruit pale blue; near water; 3°–10° high. (Pl. III.)

24. Red-osier Dogwood. (Cornus stolonifera.)

LEAF: 2′–4′, simple, opposite, entire, broad-ovate, base rounded, apex pointed, roughish, whitish beneath, branches red-purple in winter. FLOWER: p., white, small (petals 4), in small flat clusters. June; fruit white or leaden; commonest north; 3°–6° high.

25. Panicled Dogwood. (Cornus paniculata.)

LEAF: 1′–3′, simple, opposite, entire, long-ovate, apex tapering, base pointed, whitish beneath. FLOWER: as in 24, but in numerous small panicles; June; fruit white, branches gray; near water; 4°–8° high. (Pl. III.)

26. Sand Myrtle. (Leiophyllum buxifolium.)

LEAF: ¼′–½′, simple, opposite (sometimes alternate), entire, crowded, oval or oblong, *glossy*, *leathery*. FLOWER: p., white (petals 5, spreading, stamens 10), small, in terminal umbels; May. New Jersey, and south; low evergreen.

27. Syringa. Mock Orange. (Philadelphus coronarius.)

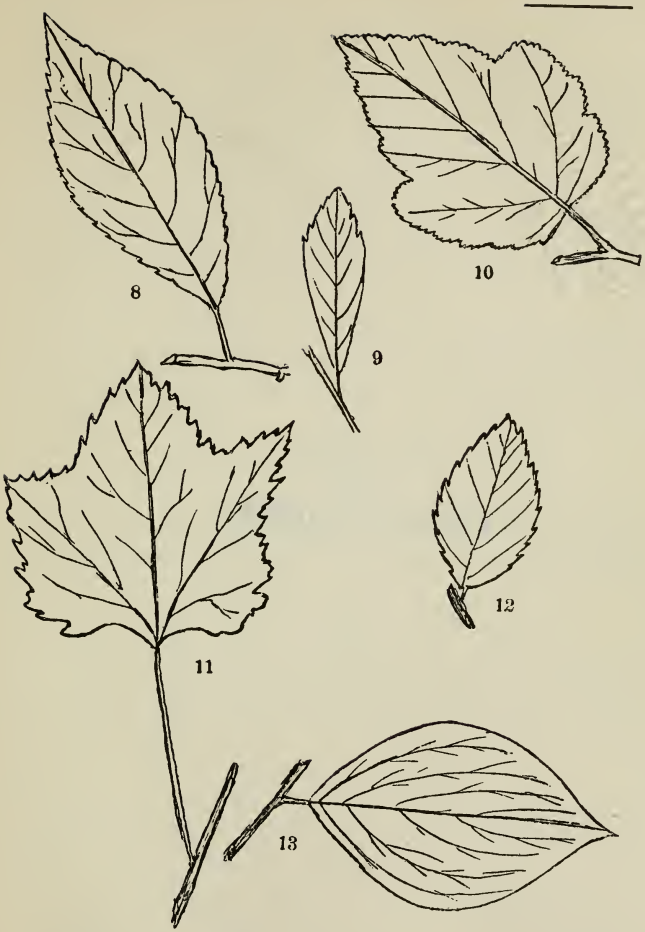
LEAF: 3′–4′, simple, opposite, remotely serrate, ovate, apex pointed. FLOWER: p., cream-white (petals 4), fragrant, in abundant clusters; June; introduced, but becoming spontaneous. (Pl. II.)

28. Wild Hydrangea. (H. arborescens.)

LEAF: 4′–5′, simple, opposite, serrate, ovate, apex pointed, green both sides, smooth. FLOWER: p., white, becoming rosy, small (the marginal ones *large* with white calyx, but no petals, stamens nor pistil), in large flat clusters; July; New Jersey to Illinois, and south. (Often without enlarged flowers.)

29. Bladder-nut. (Staphylea trifolia.)

LEAF: pinnate, opposite; leaflets, 3–5, serrate, ovate, apex pointed, 3′–4′ long. FLOWER: p., white (petals 5), in terminal drooping clusters, showy; May; pod large, 3-sided, 3-parted at top; 6°–10° high. (Pl. III.)



8. Winterberry. **15.** (av. size)
9. Inkberry. **17.** (3/8)
10. Ninebark. **18.** (2/3)
11. Wild Currant. **20.** (av. size)
12. Syringa. **27.** (1/3)
13. Round-leaved Dogwood. **22.** (1/2)

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30. Stuartia. (S. virginica.)

LEAF: 2′–4′, simple, alternate, finely serrate, long-ovate, soft hairy beneath. FLOWER: p. or m., white (petals 5, 1′ long), single, short-stemmed, showy. Virginia.

30ª. Stuartia. (S. pentagyna.)

LEAF: as in 30, but smoother. FLOWER: p. or m., cream-tinted, larger than in 30 (petals 5 or more, crimped on edge, numerous stamens, 5 styles), single, very showy, cultivated; July, August. South Virginia. 6°–12° high.

31. White Flowering Raspberry. (Rubus nutkanus.)

LEAF: 4′–8′, simple, alternate, 5-lobed, coarsely serrate. FLOWER: p., white, large (petals 5, stamens numerous) in small clusters. Michigan.

32. Cassena. Yaupon. (Ilex Cassine.)

LEAF: 1′–1½′, simple, alternate, round-toothed, lance-ovate to elliptical, leathery. FLOWER: p. and m., white or greenish-white (petals and stamens 4–6), small, single and almost stemless-clustered; calyx teeth *blunt;* May. Virginia.

33. Dahoon. Holly. (Ilex Dahoon.)

LEAF: 2′–3′, simple, alternate, entire, or serrate toward apex, oblong or reverse lance-shaped, edge rolled under, leathery. FLOWER: as in 32, but calyx teeth *sharp;* May, June. Virginia, swamps near coast.

34. Ilex. (I. decidua.)

LEAF: 2′–4′, simple, alternate, blunt-toothed, *glossy above*, thickish when old. FLOWER: as in 32, but calyx teeth *sharp;* May. Virginia, Illinois, near water.

35. Odorless Syringa. (Philadelphus inodorus.)

LEAF: 3′–4′, simple, opposite, entire or somewhat serrate; ovate, apex pointed, *smooth*. FLOWER: p., white (petals 5, stamens numerous), not fragrant, single or few-clustered, showy mountains of Virginia.

36. Large-flowered Syringa. (Philadelphus inodorus, var. grandiflorus.)

LEAF: 3′–4′, as in 35, but somewhat hairy. FLOWER: as in 35, but larger, and calyx-lobes longer and tapering. Virginia; cultivated.

37. Rough-leaved Dogwood. (Cornus asperifolia.)

LEAF: 2′–4′, simple, opposite, entire, ovate, apex pointed, *quite rough above*, downy beneath, branchlets rough. FLOWER: p., white, small (petals 4), in broad flat clusters; May, June. Illinois, dry soil.

38. Stiff Cornel. (Cornus stricta.)

LEAF: 2′–4′, simple, opposite, entire, ovate or long-ovate, apex quite tapering, base pointed, smooth. FLOWER: p., white, small (petals 4), in loose flat clusters. Virginia, swamps; 8°–15° high.

39. Dwarf Thorn. (Cratægus parvifolia.)

LEAF: ½′–1½′, simple, alternate, round-toothed, obovate with long, narrow base, thick, glossy above when mature. FLOWER: p., white, 1–3-clustered; May; fruit yellowish. New Jersey and south; 3°–6° high; thorny. (Pl. III.)

40. Sloe. Black Thorn. (Prunus spinosa.)

LEAF: 1′–3′, simple, alternate, serrate, long-ovate or elliptical. FLOWER: p., white (petals 5, stamens rather numerous), few-clustered, before or with leaves; fruit small, black, with a bloom. Maine to Pennsylvania; thorny.

41. White Thorn. (Cratægus spathulata.)

LEAF: 2′–3′, simple, alternate, *round-toothed* toward apex, occasionally lobed, long-obovate, base tapering, thickish, glossy. FLOWER: p., white, in large clusters; May; fruit red. Virginia; 10°–15° high; thorny.

42. White Thorn. (Cratægus apiifolia.)

LEAF: 2′–3′, simple, alternate, serrate, 5–7-*deeply*-lobed, *roundish*. FLOWER: as in 41; March, April. Virginia; thorny.

14. Silky Dogwood. **23.** (5/6)
15. Panicled Dogwood. **25.** (2/3)
16. Bladder-nut. **29.** (1/3)
17. Dwarf Thorn. **30.** (3/4)
18. Raspberry and Blackberry Type. **43,** etc.

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43. Wild Red Raspberry. (Rubus strigosus.)

LEAF : pinnate ; leaflets, 3–5, long-ovate, apex pointed, irregularly serrate (lateral ones *without stems*), *whitened beneath.* FLOWER : p., white (petals 5, stamens numerous) ; June, July ; fruit red, hemispherical ; stalks *with bloom*, and bristly rather than prickly. (Pl. III.)

44. Black Raspberry. Thimbleberry. (Rubus occidentalis.)

LEAF : pinnate ; leaflets, 3 (seldom 5), ovate, coarsely serrate, apex pointed, *whitened beneath*, lateral ones short-stemmed ; stalks and leaf-stems with bloom and prickly. FLOWER : as in 43 ; fruit purple-black, hemispherical. (Pl. III.)

45. High Blackberry. Common Blackberry. (Rubus villosus.)

LEAF : pinnate ; leaflets, 3 (or lateral ones in pairs), ovate, serrate, apex pointed, *green beneath.* FLOWER : as in 43, but in lengthened leafless clusters ; May, June ; stalks *grooved*, prickly and without bloom ; 1°–6° high. (Pl. III.)

46. Low Blackberry. Dewberry. (Rubus canadensis.)

LEAF : about as in 45. FLOWER : as in 45 ; stalk but little prickly, *not grooved*, with no bloom, considerably trailing. (Pl. III.)

47. Sand Blackberry. (Rubus cuneifolius.)

LEAF : pinnate ; leaflets, 3–5, wedge-obovate, serrate toward apex, thickish, *whitened below.* FLOWER : p., white or rose-tinted (petals large, three times length of sepals), 2–4-clustered ; May–July. Southern New York and south ; 1°–3° high ; prickly.

48. Low Bush-blackberry. (Rubus trivialis.)

LEAF : pinnate ; leaflets, 3 (or lateral ones paired), long-ovate to lance-shaped, serrate, evergreen, leathery. FLOWER : as in 47 ; March–May ; stalks prickly, and almost trailing. Virginia.

49. White Swamp Azalea. Clammy Azalea. (Rhododendron viscosum.)

LEAF: 1′–2′, simple, alternate, often crowded at end of branch, entire, long-obovate, apex often bristle-tipped, smooth. FLOWER: m., white or rosy, fragrant (corolla funnel-form, with 5 spreading lobes), sticky, stamens and style protruding from corolla-tube, 6–12-clustered; June, July; branchlets bristly. A variety *glauca* has leaves with bloom on one or both sides, often rough hairy; another, *nitida*, is dwarf, leaf green both sides. RANGE: Maine to Virginia, swamps near coast; 4°–10° high. (Pl. IV.)

50. Common High Blueberry. Swamp Blueberry. (Vaccinium corymbosum.)

LEAF: 1′–2′, simple, alternate, entire (in some varieties serrate), ovate to lance-shaped, glossy to pale. FLOWER: m. (corolla white or rosy-tinted, oblong-cylindrical, 5-toothed), clustered, *before or with the leaves;* 5°–10° high. (Pl. IV.)

51. Low Blueberry. (Vaccinium pennsylvanicum.)

LEAF: ¾″–1′, simple, alternate, entire or finely serrate, oval or obovate, thickish, dull green, with bloom beneath. FLOWER: m., white or reddish-white (corolla bell-shaped), clustered; May. New England and south; 1°–2½° high.

52. Leather-leaf. (Cassandra calyculata.)

LEAF: 1′, simple, alternate, entire, oblong, leathery, scurfy beneath. FLOWER: m., white (corolla cylindrical, 5-toothed), small, in one-sided leafy racemes in early spring; near water; low shrub. (Pl. IV.)

53. Andromeda. Stagger-bush. (Andromeda mariana.)

LEAF: 1′–3′, simple, alternate, entire, oval or oblong, rather leathery. FLOWER: m., white or pale red (corolla long-ovoid, 5-toothed), drooping, in clusters; May, June. Rhode Island to Virginia, in sand, near coast; 2°–4° high. (Pl. IV.)

54. Privet Andromeda. (A. ligustrina.)

LEAF: 1′–3′, simple, alternate, entire, obovate to lance-shape. FLOWER: m., white, small (corolla somewhat globular, 5-toothed), thickly clustered, with last year's pods often still clinging; June, July. Near water; 3°–10° high. (Pl. IV.)

55. Marsh Andromeda. Wild Rosemary. (A. polifolia.)

LEAF: about 1′, simple, alternate, entire, lance-shaped or narrow-oblong, thick, evergreen, edge rolled under, white beneath. FLOWER: m., white, small (corolla rather globular, 5-toothed), in terminal clusters; May; plant smooth, with bloom. Pennsylvania, west and north, in bogs; 6′–18′ high.

56. Groundsel-tree. (Baccharis halimifolia.)

LEAF: 2′–4′, simple, alternate, upper leaves often entire, lower coarse-toothed, obovate, base wedge-shaped. FLOWER: m., whitish or yellow, in "heads," each a cluster of many small tubular blossoms (corolla of pistillate flowers thread-like; of staminate, larger and 5-lobed); "heads" single and clustered; September. Massachusetts to Virginia, on sea-shore; 6°–12° high.

57. Leucothoë. (L. racemosa.)

LEAF: 1′–2½′, simple, alternate, finely serrate, oblong or oval, apex sharp, *thickish*. FLOWER: m., white, fragrant (corolla cylindrical, 5-toothed), in long, *one-sided* spikes; May, June, Massachusetts to Virginia, near coast; 4°–6° high.

58. Withe-rod. (Viburnum nudum and cassinoides.)

LEAF: 2′–4′, simple, opposite, entire or round-toothed, oval to lance-shaped, *thickish*. FLOWER: m., white, all small (corolla spreading, 5-lobed), in large, flat, showy clusters; in two varieties, as leaf is more entire (south) or more toothed (north); May, June. 5°–10° high. (Pl. IV.)

59. Button-bush. (Cephalanthus occidentalis.)

LEAF: 3′–5′, simple, opposite or 3-whorled, entire, long-stemmed, ovate to obovate, apex sharp. FLOWER: m., white, very small, clusters in *balls* (corolla tubular, 4-toothed); July, August. Near water. (Pl. IV.)

60. Common Privet. (Ligustrum vulgare.)

LEAF: 1′–2′, simple, opposite, entire, lance-shape to obovate, thickish, *smooth*, dark green. FLOWER; m., white, small (corolla funnel-shaped, 4-lobed), in erect clusters; June. Introduced for hedges, but locally spontaneous in New England and Pennsylvania.

61. Tartarian Honeysuckle. (Lonicera tartarica.)

LEAF: 1′–2′, simple, opposite, entire, ovate, base cordate, somewhat glossy. FLOWER: m., white to purplish, small, fragrant, in pairs on a single stem (corolla funnel-shaped, 5-lobed); April–June. Introduced, cultivated, locally spontaneous.

62. Arrow-wood. (Viburnum dentatum.)

LEAF: 2′–3′, simple, opposite, coarsely serrate, ovate to roundish, base cordate, stem slender. FLOWER: m., white, all small (corolla 5-lobed), in flat clusters; June; fruit ovoid, blue; 5°–10° high. (Pl. V.)

63. Soft Viburnum. (V. molle.)

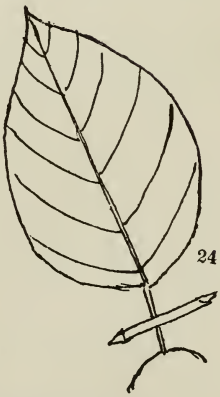
LEAF: much as in 62, but downy beneath, *as also* leaf- and flower-stem and branchlets. FLOWER: as in 62, of which it may be only a variety. Martha's Vineyard, and south.

64. Downy Arrow-wood. (Viburnum pubescens.)

LEAF: as in 62, but less serrate, apex sharp or tapering, downy beneath, and *very short-stemmed*. FLOWER: as in 62; fruit dark purple. RANGE: Vermont to New York, Kentucky and Wisconsin; low, straggling.

65. Marsh Elder. Highwater Shrub. (Iva frutescens.)

LEAF: 2′–4′, simple, opposite; lower coarsely serrate, oval to lance-shaped, thickish (upper narrow, entire, or mere bracts). FLOWER: m., white or greenish-white, small (corolla tubular or funnel-shaped), massed in small, flat "heads," pistillate and staminate in each; July–September. Massachusetts to Virginia; salt marshes near coast; 3°–8° high.



19. Clammy Azalea. **49.** (1/2)
20. Leather-leaf. **52.** (7/8)
21. Common Blueberry. **50.** (1/2)
22. Andromeda. **53.** (2/3)
23. Withe-rod. **58.** (2/3)
24. Button-bush. **59.** (1/2)

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66. Hobble-bush. Am. Wayfaring-tree. (Viburnum lantanoides.)

LEAF: 4′–8′, simple, opposite, serrate, roundish, base cordate, apex pointed, *rusty-scurfy* beneath and on stalks and branchlets. FLOWER: m., white (corolla 5-lobed), in flat clusters (no common flower-stalk), the marginal of each cluster *much larger and showy*, without stamens and pistils; May; fruit ovoid, dark red. RANGE: New England, to Pennsylvania, and south in mountains. (Pl. V.)

67. Cranberry-tree. High Cranberry Bush. (Viburnum opulus.)

LEAF: 3′–5′, simple, opposite, serrate, 3-lobed, lobes serrate only toward their apex. FLOWER: as in 66, but on a common flower-stalk; June, July; fruit globular, bright red. RANGE: northerly, and in Alleghanies, near water; 5°–10° high; in cultivation it is the "snow-ball" or "Guelder rose," with *all* the flowers large. (Pl. V.)

68. Maple-leaved Arrow-wood. Dockmackie. (Viburnum acerifolium.)

LEAF: 2′–4′, simple, opposite, coarsely serrate, 3-lobed, roundish, downy beneath, 3-ribbed. FLOWER: m., white, all small (corolla 5-lobed, stamens *longer* than corolla), in small flat clusters; May, June; fruit blackish; 2°–6° high. (Pl. V.)

69. Common Elder. (Sambucus canadensis.)

LEAF: pinnate, opposite; leaflets, 5–11 (usually 7), 2′–4′ long, serrate, oblong, apex sharp, lower often deeply 2–3-lobed. FLOWER: m., white, small (corolla spreading, 5-lobed), in large *flat* clusters; June, July; fruit blackish; pith *white* or *pinkish-white;* 5°–10° high. (Pl. V.)

70. Red-berried Elder. (Sambucus pubens.)

LEAF: pinnate, opposite; leaflets, 5–7, serrate, short lance-shaped, downy beneath. FLOWER: as in 69, but in *convex* or *pyramidal* clusters; May; fruit red, occasionally white; June; pith *red* or *brown;* northerly, and south in mountains; 2°–10° high.

71. Arrow-wood. (Viburnum obovatum.)

LEAF: 1′–1½′, simple, opposite, entire or finely serrate, obovate (base often long-tapering), thickish, glossy. FLOWER: m., white, small (corolla spreading, 5-lobed), in small, *flat* clusters; May. Virginia, 2°–8° high.

72. Storax. (Styrax grandifolia.)

LEAF: 3′–6′, simple, alternate, entire or minutely serrate, obovate, apex pointed, white-cottony beneath. FLOWER: m., white (corolla 4–8-deeply-lobed, lobes mostly downy), showy, ½′ long, in long racemes. Virginia, in woods.

73. Storax. (Styrax pulverulenta.)

LEAF: 1′–1½′, simple, alternate, entire or minutely serrate, oval or obovate, scurfy-woolly beneath. FLOWER: as in 72, but 1–3-clustered, fragrant, ½′ long. Virginia; 1°–4° high.

74. Storax. (Styrax americana.)

LEAF: 1′–3′, simple, alternate, entire or minutely serrate, oblong, both ends sharp, smooth. FLOWER: as in 72, but single or 3–4-clustered. Virginia; 4°–8° high.

75. Farkle-berry. (Vaccinium arboreum.)

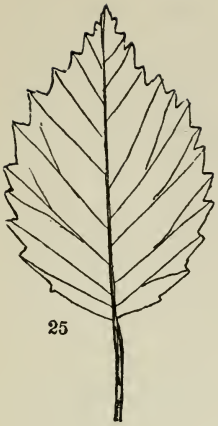
LEAF: 1′–2′, simple, alternate, entire or finely serrate, oval to obovate, bright green and glossy above. FLOWER: m., white (corolla bell-shaped, 5-toothed, size of blueberry blossom), single along stem, or clustered; June; berry black. Virginia (?), and South Illinois; 8°–15° high.

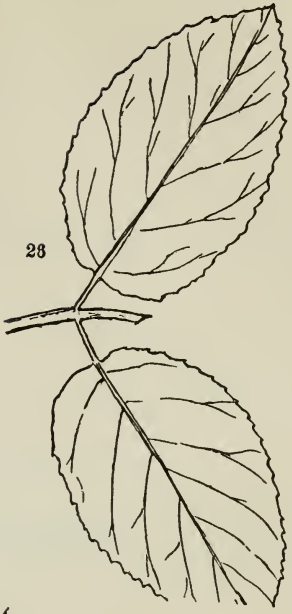
76. Groundsel-tree. (Baccharis glomeruliflora.)

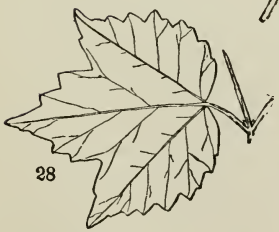
LEAF: 2′–4′, simple, alternate, upper entire, lower serrate, obovate-oblong. FLOWER: as in 56, but the "heads" larger, and the leafy scales beneath each head broader and blunt; September. East Virginia; 6°–12° high.

77. Blueberry. (Vaccinium erythrocarpon.)

LEAF: 1′–2′, simple, alternate, bristly serrate, oblong, apex tapering, thin, smooth. FLOWER: m., white (corolla 4-lobed, lobes rolled back), small, single; July; berry purple, tasteless. Mountains of Virginia; 1°–4° high.







25. Arrow-wood. **62.** (3/4)
26. Hobble-bush. **66.** (1/3)
27. High Cranberry-bush. **67.** (2/5)
28. Maple-leaved Arrow-wood. **68.** (1/2)
29. Common Elder. **69.** (1/6)

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78. Leucothoë. (L. axillaris.)

LEAF: 1′–2′, simple, alternate, finely serrate, oval to short-lance-shaped, glossy, leathery, *very short-stemmed.* FLOWER: m., white (corolla rather ovoid, 5-toothed), *stemless*, in dense racemes (sepals *broad* ovate); February–April. Virginia, near water; 2°–4° high.

79. Leucothoë. (L. Catesbæi.)

LEAF: 1′–2′, much as in 78, but *longer-stemmed.* FLOWER: as in 78, but sepals *narrower*, apex often sharp; May. Mountains of Virginia, near water; 2°–4° high.

80. Leucothoë. (L. recurva.)

LEAF: as in 78, but *not glossy nor leathery.* FLOWER: as in 78, but *short-stemmed*, in one-sided racemes; April. Mountains of Virginia; branches recurved.

81. Andromeda. (A. floribunda.)

LEAF: 1′–3′, simple, alternate, finely serrate, short-lance-shaped, thick, evergreen, with stem. FLOWER: m., white (corolla rather ovoid, 5-toothed, 5-angled), in dense panicled racemes; April. Virginia, in mountains; 2°–10° high; young branches bristly.

82. Callicarpa. French Mulberry. (C. Americana.)

LEAF: 1′–3′, simple, opposite, serrate, long-ovate, base tapering, whitish beneath. FLOWER: m., whitish (corolla long-bell-shaped, 4–5-lobed, stamens 4), small, in small clusters along branch; May–July. Virginia.

83. Few-flowered Arrow-wood. (Viburnum pauciflorum.)

LEAF: 2′–3′, simple, opposite, serrate, 3-lobed near apex, roundish, 5-*ribbed at base.* FLOWER: m., white, small (corolla spreading, 5-lobed, stamens *shorter* than corolla), in *small*, flat clusters; June; fruit globular, red; northern part of New Hampshire, New York, and Wisconsin; low shrub.

84. Bog Bilberry. (Vaccinium uliginosum.)

LEAF: ¼′–½′, simple, alternate, entire, oblong to obovate, dull green, lighter beneath. FLOWER: m., white (corolla almost globular, 4-toothed), 1–3-clustered, drooping; June, July; berry black, sweet. Alpine tops of mountains in New England and New York; 4′–18′ high.

85. Bilberry. (Vaccinium cæspitosum.)

LEAF: ½′ or less, simple, alternate, serrate, obovate, glossy. FLOWER: m., white (corolla oblong, 5-toothed), *single*, drooping; June; berry blue. Alpine tops of White Mountains; dwarf.

86. Bilberry. (Vaccinium ovalifolium.)

LEAF: ½′ or less, simple, alternate, hardly serrate, elliptical, apex blunt, pale green, with bloom. FLOWER: much as in 85; May; berries blue. Near Lake Superior; 3′–10′ high, straggling.

87. Bilberry. (Vaccinium myrtilloides.)

LEAF: ½′ or less, simple, alternate, finely serrate, ovate, apex sharp, *bright green*. FLOWER: as in 85, but corolla larger and almost globular; May, June; berry black, large. Near Lake Superior; 1°–4° high.

88. Canada Blueberry. (Vaccinium canadense.)

LEAF: about 1′, simple, alternate, entire, lance-shaped to elliptical, *both sides downy, as also branchlets*. FLOWER: m., white (corolla bell-shaped, 5-toothed), clustered, *before leaves* in spring. Maine to Wisconsin; 1°–2° high.

89. Alpine Azalea. (Loiseleuria procumbens.)

LEAF: ¾′ or less, simple, opposite, entire (edge rolled back), elliptical, leathery, evergreen. FLOWER: m., small, white or rosy (corolla bell-shaped, 5-lobed, 5 stamens), 2–5-clustered; June. Alpine tops of White Mountains; low, much branched.

90. American Mistletoe. (Phoradendron flavescens.)

LEAF: ¾′–1½′, simple, opposite, entire, oval to obovate, yellowish, thick. FLOWER: whitish or greenish-white (*no petals*,

calyx corolla-like, globular, generally 3-lobed), staminate and pistillate, in spike-like clusters. FRUIT: white, size of small pea. Parasitic on various trees. New Jersey to Illinois, and south. (Pl. VI.)

91. Fothergilla. (F. alnifolia.)

LEAF: 1′–2′, simple, alternate, serrate near apex, obovate or oval. FLOWER: *no corolla*, calyx bell-shaped, slightly 5–7-toothed, long white stamens about 24, on edge of calyx, developing somewhat before the leaves; April, May. Virginia; low shrub.

92. Rhododendron. Great Laurel. Rose Bay. (Rhododendron maximum.)

LEAF: 4′–10′, simple, alternate, entire, oval to elliptical, apex sharp, base tapering, edge slightly revolute, *thick*, *evergreen*. FLOWER: m., pale rose to whitish, greenish in throat, yellow- or red-spotted (corolla 1′–2′ broad, 5-lobed), in *large* terminal clusters; July, August. RANGE: Maine to Ohio (damp woods), in mountains of Pennsylvania and south; shrub, rarely low tree in Pennsylvania. (Pl. VI.)

93. Mountain Laurel. Calico-bush. (Kalmia latifolia.)

LEAF: 2′–4′, simple, alternate, sometimes opposite or whorled, entire, lance-shaped or elliptical, both ends pointed, *glossy*, evergreen, leathery. FLOWER: m., rosy to white, large, showy, sticky (corolla broad bell-shaped, stamens 10, ends sunk in depression of corolla), in large terminal clusters; May, June; northerly a shrub, in Pennsylvania a low tree.

94. Rhodora. (R. Canadense.)

LEAF: 1′–3′, simple, alternate, entire, oblong to obovate, whitish beneath, pale. FLOWER: rose-purple, rarely white (corolla in 2 parts, one with three lobes, the other very deeply lobed or of two distinct petals, 10 stamens), in small clusters before the leaves; May. New England to Pennsylvania, mountains or damp woods; low shrub.

95. Smooth Azalea. (Rhododendron arborescens.)

LEAF: 2′–3′, simple, alternate, entire, obovate, *smooth*, *glossy* above, a bloom beneath, edge bristly hairy, thickish. FLOWER: m., rose-color, fragrant, slightly sticky (corolla funnel-form with 5 spreading lobes shorter than tube; stamens and style much longer than corolla tube), in terminal clusters; June. Mountains of Pennsylvania, and south; 3°–12° high.

96. Flame-colored Azalea. (Rhododendron calendulaceum.)

LEAF: 2′–3′, simple, alternate, entire, obovate to oblong, hairy (as also branchlets). FLOWER: m., orange to flame-color, not odorous nor sticky (corolla as in 95, but its tube *shorter* than the lobes), in terminal clusters, profuse, before the leaves; May. Pennsylvania and south; 3°–10° high; cultivated.

97. Pinxter-flower. Purple Azalea. (Rhododendron nudiflorum.)

LEAF: 2′–3′, much as in 96, branchlets hairy. FLOWER: m., pink, purple, buff, mottled or white, often fragrant (corolla funnel-form with 5 *large* spreading lobes; stamens and style *much longer* than tube), clustered, with or before leaves; April, May; 2°–6° high.

98. Black Crowberry. (Empetrum nigrum.)

LEAF: ¼′, simple, alternate, entire, crowded, narrow, evergreen. FLOWER: reddish (no corolla, 3 spreading sepals, 3 stamens), very small, along branch; May, June. FRUIT: black, berry-like. Alpine tops of mountains in New England and New York, and along Maine coast and Lake Superior; low, spreading.

99. Common Black Huckleberry. (Gaylussacia resinosa.)

LEAF: 1′–2½′, simple, alternate, entire, oval to long-ovate, thickly covered with shining resinous dots. FLOWER: m., white, red- or purple-tinged, corolla cylindrical, 5-lobed, a reddish bract, falling early, with each flower and cluster; May, June. FRUIT: black, rarely white, without bloom; 1°–3° high.

100. Dwarf Huckleberry. (Gaylussacia dumosa.)

LEAF: 1′–1½′, simple, alternate, entire or finely serrate, obovate, *bristle-tipped*, somewhat thick and glossy. FLOWER: m., white, red- or purple-tinged (corolla bell-shaped, 5-lobed), *with leaf-like bract* as long as flower-stem, longish-clustered; June. FRUIT: black, tasteless. Maine to Virginia, near coast; 1°–5° high.

101. Dangleberry. Blue Tangle. (Gaylussacia frondosa.)

LEAF: 1′–2′, simple, alternate, entire, obovate, dull green, bloom beneath. FLOWER: as in 100, but corolla more globular, with slender bract *shorter* than flower-stem; May, June. FRUIT: blue, sweet, with bloom. New England (coast) to Kentucky; 1°–5° high.

102. Mezereum. Daphne. (D. mezereum.)

LEAF: 3′–4′, simple, alternate, entire, lance-shaped. FLOWER: purplish rose, rarely white (no corolla, calyx 4-lobed, spreading, 8 stamens), few-clustered, before the leaves; April. Introduced, and now somewhat spontaneous in Massachusetts and New York.

103. Hairy Laurel. (Kalmia hirsuta.)

LEAF: ½′, simple, alternate and opposite, entire, oblong or lance-shaped, stiff-hairy (as also branches), at length smooth; leathery, evergreen. FLOWER: m., rose-color (corolla open bell-shaped, 5-lobed, ends of stamens sunk in 10 depressions), single along branches; May–September. Virginia; 1° high.

104. Shrubby Althæa. Rose of Sharon. (Hibiscus Syriacus.)

LEAF: 2′–3′, simple, alternate, 3-lobed (middle one long), coarse-serrate, base wedge-shaped, apex sharp. FLOWER: 5-petaled, rose-colored, large, many stamens *in a column;* September. Introduced, and locally spontaneous; tall. (Pl. VI.)

105. Hardhack. Steeple-bush. (Spiræa tomentosa.)

LEAF: 1′–2½′, simple, alternate, serrate, ovate to oblong, *woolly beneath, as also stems* (thick and rusty on new shoots). FLOWER: p., rose-colored, rarely white, very small, in erect dense clusters; July. Commonest in New England; 2°–4° high. (Pl. VI.)

106. Purple-flowering Raspberry. (Rubus odoratus.)

LEAF: 5′–10′ across, simple, alternate, serrate, 3–5-lobed, roundish, large. FLOWER: 5-petaled, rose-purple, often 2′ broad (often 200 stamens), clustered; June–August; stalk, branches and calyx *clammy-hairy;* not prickly; commoner northward; 3°–5° high. (Pl. VI.)

107. Box-huckleberry. (Gaylussacia brachycera.)

LEAF: 1′, simple, alternate, finely round-toothed, oval, smooth, evergreen, thick. FLOWER: m., white, red-or-purple-tinged (corolla long-bell-shaped, 5-lobed), clustered; May. Pennsylvania and Virginia; 1° high.

108. Coral-berry. Indian Currant. (Symphoricarpus orbicularis.)

LEAF: 1′–2′, simple, opposite, entire (often lobed or wavy-toothed on young shoots), oval. FLOWER: m., rosy-white (corolla bell-shaped, 4–5-lobed, hairy within, 4–5 stamens), crowded in clusters *along* branch; July; berry *small*, dark *red*. West New York and Pennsylvania, and westward; cultivated; 2°–3° high.

109. Snowberry. (Symphoricarpus racemosus.)

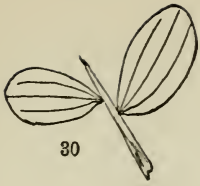
LEAF: as in 108. FLOWER: as in 108, but in clusters at *end* of branch; June–September; berry *large, white*. Virginia to Pennsylvania, and Wisconsin; cultivated; 2°–4° high. (Pl. I.)

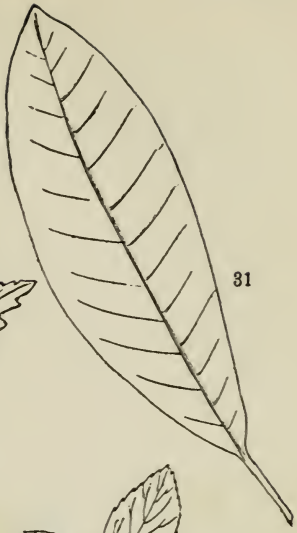
110. Wolfberry. (Symphoricarpus occidentalis.)

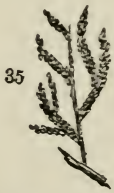
LEAF: as in 108. FLOWER: as in 108, but larger and in dense clusters *both* terminal and lateral, and stamens *projecting beyond* corolla-tube; July; berry white. Illinois, Michigan; 2°–4° high.

111. Sheep Laurel. Lambkill. (Kalmia angustifolia.)

LEAF: 1′–2′, simple, opposite or 3-whorled, entire, oval to elliptical, leathery, evergreen, lighter beneath. FLOWER: m., crimson (corolla broad bell-shaped, 5-lobed, 10 stamens, their tips inserted in depressions of corolla), in lateral clusters; May, June; hill-sides; 2°–3° high.







30. American Mistletoe. **90.** ($^2/_3$)
31. Rhododendron. **92.** ($^2/_5$)
32. Rose of Sharon. **104.** ($^3/_4$)
33. Hardhack. **105.** ($^2/_5$)
34. Purple-flowering Raspberry. **106.** ($^1/_4$)
35. Heather (Calluna). **112.** ($^1/_{12}$)

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112. Heather. (Calluna vulgaris.)

LEAF: ½′ or less, simple, opposite, entire (with 2 sharp projections at base), minute, crowded, evergreen. FLOWER: m., rose-colored or white (corolla bell-shaped, 4-lobed, much shorter than calyx, 8 stamens), in short spike-like racemes chiefly one-sided; July, August. Locally in Maine and Massachusetts. (Pl. VI.)

113. Swamp Rose. Carolina Rose. (Rosa Carolina.)

LEAF: pinnate, alternate; leaflets, 5–9, serrate, ellipticai, apex often sharp, *dull green above*, lighter below, *stipules narrow*. FLOWER: p., rose-colored (5 petals, pistils and stamens numerous), several-clustered; June–September; flower-stems and calyx bristly; stalks with hooked prickles; low ground; 4°–7° high. (Pl. VII.)

114. Dwarf Wild-rose. (R. lucida.)

LEAF: pinnate, alternate; leaflets, 5–9, serrate, elliptical to lance-shaped, *glossy*, *stipules broad*. FLOWER: as in 113, but 1–3-clustered; May–July; prickles fewer than in 113, and nearly straight; dry ground; 1°–2° high. (Pl. VII.)

A variety (*nitida*) has narrow leaflets, both ends sharp, and flowers usually single.

115. Early Wild-rose. (R. blanda.)

LEAF: pinnate, alternate; leaflets, 5–7, serrate, oval to oblong, *apex blunt*, *dull green both sides*, large stipules. FLOWER: as in 113, but *light* rose-color; May, June; flower-stems and calyx-tube *smooth*, *and with bloom*; few prickles. Virginia to Pennsylvania, and west; 1°–3° high. (Pl. VII.)

116. Sweet-brier. (Rosa rubiginosa.)

LEAF: pinnate, alternate; leaflets, 5–7, serrate, ½′–¾′ long, base rounded, *resinous-dotted beneath*, *fragrant* when crushed, stems hairy. FLOWER: p., light rose-color, mostly single, *with bristly stems*, sepals serrate and hairy; June–August; prickles numerous; often climbing. (Pl. VII.)

117. Bristly Locust. Rose-acacia. (Robinia hispida.)

LEAF: pinnate, alternate; leaflets, 13–19, 1′–1½′ long, entire, oval to oblong, apex bristle-pointed; *stems* and *branchlets bristly.* FLOWER: deep rose-colored, pea-shaped, large, scentless, clustered; May, June. Mountains of Virginia; cultivated; 3°–8° high. (Pl. VII.)

118. Hudsonia. (H. ericoides.)

LEAF: ⅙′–⅓′, simple, alternate and opposite, crowded, entire, slender, awl-shaped, downy, spreading from branch. FLOWER: p., bright yellow (petals 5, stamens rather numerous), small and showy, on leafless stalks; May. Maine to Virginia, near coast; scarcely 1° high; greenish, downy. (Pl. VII.)

119. Hudsonia. (H. tomentosa.)

LEAF: much as in 118, but smaller, appressed to branch. FLOWER: as in 118, but usually on leafy branches; May, June. On coast from Maine to Maryland, and along the Great Lakes; scarcely 1° high; whitish, downy. (Pl. VII.)

120. Woad-waxen. Whin. (Genista tinctoria.)

LEAF: 1′–2′, simple, alternate, entire, lance-shaped, branches angled. FLOWER: yellow, small, pea-shaped, in spiked racemes; June. Introduced, now spontaneous in Massachusetts (Essex County) and New York; low shrub.

121. Spice-bush. Wild Allspice. (Lindera benzoin.)

LEAF: 2′–5′, simple, alternate, entire, obovate-oblong, both ends pointed, pale beneath. FLOWER: yellow, small (no corolla, yellow calyx 6-parted, spreading), almost stemless, in numerous compound clusters along branch, *before the leaves;* March, April; somewhat fragrant; damp woods; 5°–15° high; branches smooth; fruit; red berry. (Pl. VII.)

122. Wild Allspice. (Lindera melissæfolia.)

LEAF: as in 121, but base blunt or cordate. FLOWER: as in 121, but clusters few; April. Virginia; branches fine-hairy.

36. Rose Type. **113.** etc.
37. Bristly Locust. **117.** (1/2)
38. Hudsonia. **118.** (1/5)
39. Spice-bush. **121.** (1/2)
40. Barberry. **125.** (1/6)
41. Witch-hazel. **127.** (1/2)
42. Fragrant Sumach. **140.** (1/2)

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123. Leatherwood. Moose-wood. (Dirca palustris.)

LEAF: 3′–4′, simple, alternate, entire, oval to obovate, short-stemmed. FLOWER: light yellow (no corolla, yellow calyx *tubular*, its edge wavy or slightly 4-toothed, 8 long stamens), 3–4-clustered along branches *before the leaves;* April. New England to Pennsylvania and Kentucky, and north; 2°–5° high.

124. Pond Spice. (Tetranthera geniculata.)

LEAF: 3′–4′, simple, alternate, entire, oblong, *hairy* on midrib beneath. FLOWER: almost identical with 121, but in simple, 2–4-flowered clusters, before the leaves; April. Virginia.

125. Common Barberry. (Berberis vulgaris.)

LEAF: 1′–2′, simple, alternate or fascicled, serrate (teeth bristle-pointed), oval; often replaced on branchlets by small forked spines. FLOWER: p., yellow (petals 6, obovate, not notched at apex, stamens 6), in drooping many-flowered clusters; May, June; berries oblong, scarlet. Introduced, and now spontaneous, chiefly in Eastern New England; 3°–8° high; thorny. (Pl. VII.)

126. American Barberry. (Berberis canadensis.)

LEAF: 1′–2′, simple, alternate, broad-round-toothed (less bristly-pointed than in 125), oval. FLOWER: as in 125, but petals notched at apex, and clusters few-flowered; June; berries oval, scarlet. Mountains of Virginia; 1°–3° high; thorny.

127. Witch-hazel. (Hamamelis virginica.)

LEAF: 3′–5′, simple, alternate, wavy-edged or broad-toothed, obovate to oval, oblique at base, *a little one-sided.* FLOWER: p., yellow (petals 4, *long and narrow*, stamens 8), in stemless clusters along branch; November; damp woods; 5°–12° high. (Pl. VII.)

128. St. Peter's-wort. (Ascyrum stans.)

LEAF: about 1′, simple, opposite, entire, oval to oblong, thickish, *black-dotted, slightly surrounding branch at base.* FLOWER: p., yellow (petals 4, obovate, stamens many), mostly single, showy, almost stemless; July, August. Long Island to Pennsylvania, and south; 1°–2° high.

129. St. Andrew's Cross. (Ascyrum Crux-Andreæ.)

LEAF: 1′ or less, simple, opposite, entire, *narrow*, *long-obovate*, *black-dotted*, thin. FLOWER: as in 128, but petals *narrow-oblong*, scarcely longer than sepals; July–September; New Jersey to Illinois, and south; 1°–2° high.

130. Shrubby St. John's-wort. (Hypericum prolificum.)

LEAF: 1′–2½′, simple, opposite, entire, lance-oblong, apex usually blunt, base narrower, *black-dotted*; branchlets 2-edged. FLOWER: p., yellow (petals 5, stamens many), ¾′ across, numerous, in thick clusters; July–September. New Jersey, west and south; 1°–6° high.

131. Shrubby St. John's-wort. (Hypericum densiflorum.)

LEAF: about 1′, as in 130, but smaller and crowded. FLOWER: as in 130, but smaller (½′–⅔′ across), more abundant in compound clusters. New Jersey to Kentucky, and west; much branched; 1°–6° high.

132. Kalm's St. John's-wort. (Hypericum Kalmianum.)

LEAF: 1′–2′, simple, opposite, entire, oblanceolate, *with a bloom*, crowded, *black-dotted*. FLOWER: as in 130, but 1′ across, few-clustered; August; branches 4-angled, branchlets 2-edged. Niagara Falls and along Northern Lakes; 1°–6° high.

133. Fly-honeysuckle. (Lonicera ciliata.)

LEAF: 2′–3′, simple, opposite, entire, oblong-ovate to oval, *base often cordate*, *with a stem*, thin, downy beneath. FLOWER: m., yellowish, ¾′ long (corolla tubular, apex 5-lobed, very slightly spurred at base), *paired* on a single stem; May; berries *red*, *separate*. Massachusetts to Pennsylvania, and west; 3°–5° high; straggling.

134. Mountain Fly-honeysuckle. (Lonicera cerulea.)

LEAF: 1′–2′, simple, opposite, entire, *oval*, *very short-stemmed*. FLOWER: as in 133, but common stem *very short*; berries *blue*, *united*. Rhode Island to Wisconsin, and north; 1°–3° high.

135. Swamp Fly-honeysuckle. (Lonicera oblongifolia.)

LEAF: 2′–3′, simple, opposite, entire, oblong, almost stemless. FLOWER: m., yellowish-white, ½′ long (corolla tubular, 5-lobed, and *deeply 2-lipped*), paired on *long* stem; June; berries *purple*, united or nearly separate. Northern New York to Wisconsin, in bogs; 2°–5° high.

136. Honeysuckle. (Lonicera involucrata.)

LEAF: 3′–6′, simple, opposite, entire, ovate-oblong, apex usually sharp, with a stem; branches 4-angled. FLOWER: m., yellowish (corolla tubular, 5-lobed, sticky-hairy), paired on single stem; June; berries purple, separate. Lake Superior and west.

137. Shepherdia. (S. canadensis.)

LEAF: 1′–2′, simple, opposite, entire, elliptical to ovate, *silvery-downy* beneath. FLOWER: yellowish, very small (no corolla, yellow calyx 4-lobed, 8 stamens), staminate clustered, pistillate often single, almost stemless; May; fruit yellow-red, round, size of small pea; rusty scales on leaves, branchlets and flowers. New York, and west.

138. Sea Ox-eye. (Borrichia frutescens.)

LEAF: 1′ or less, simple, opposite, entire, or serrate toward base, rather lance-shaped, leathery or fleshy. FLOWER: yellow (anthers blackish), in single, terminal, many-flowered "heads." Virginia; 6′–12′ high; plant whitish-fine-hairy.

139. Bush Honeysuckle. (Diervilla trifida.)

LEAF: 2′–4′, simple, opposite, serrate, long-ovate, apex tapering, with stem. FLOWER: m., light yellow (corolla funnel-form, 5-lobed, 5 stamens), *mostly 3-clustered* on single stem; June–August; pod surmounted by a slender beak, on which the sepals are still seen; 1°–2° high.

140. Fragrant Sumach. (Rhus aromatica.)

LEAF: pinnate, alternate; leaflets, 3, broad-ovate, 1′–3′ long, irregularly and coarsely serrate, the middle one with wedge-

shaped base, thickish when old, fragrant when bruised. FLOWER: p., light yellow, small (petals and stamens 5), crowded in clusters *before the leaves;* April, May; 2°–6° high. (Pl. VII.)

141. Shrubby Cinque-foil. (Potentilla fruticosa.)

LEAF: pinnate, alternate; leaflets, 5–7, *entire*, about 1′ long, lance-oblong, silky (especially beneath), crowded. FLOWER: p., yellow (petals 5, stamens many), abundant, at ends of branchlets; June–September; damp places; 2°–4° high. (Pl. VIII.)

142. Lapland Rose-bay. (Rhododendron lapponicum.)

LEAF: ½′, simple, alternate, entire, elliptical, apex blunt, evergreen, *dotted with rusty scales*. FLOWER: m., purplish (corolla broad bell-shaped, 5-lobed, 5–10 stamens), about ⅔′ across, few-clustered, terminal; July. Alpine tops of mountains in Maine, New Hampshire, and New York; very low shrub.

143. Rhododendron. (R. catawbiense.)

LEAF: 3′–5′, simple, alternate, entire, oval to oblong, *base and apex rounded*, lighter beneath, evergreen. FLOWER: m., lilac-purple (corolla broad bell-shaped, 5-lobed, 10 stamens), in terminal clusters; June. High mountains of Virginia; 3°–6° high.

144. Broom-crowberry. (Corema conradii.)

LEAF: ¼′, simple, alternate, entire, *narrow*, scattered or crowded; evergreen. FLOWER: with no corolla nor calyx: 3–4 *long purple stamens;* in terminal "heads," each 10–15-blossomed; March, April. Maine to New Jersey, along coast; low shrub.

145. Phyllodoce. (P. taxifolia.)

LEAF: ½′, simple, alternate, entire, linear, apex blunt, rough-edged. FLOWER: m., purplish (corolla long-urn-shaped, 5-toothed, 10 stamens), single or few-clustered at top of branch; July. Alpine tops of mountains in Maine and New Hampshire; low evergreen shrub.

146. Squaw Huckleberry. Deerberry. (Vaccinium stamineum.)

LEAF: 1′–2′, simple, alternate, entire, oval or ovate, whitish beneath. FLOWER: m., purplish or greenish-white (corolla bell-shaped, 5-lobed, 10 stamens), in long, leafy, terminal clusters; May, June; berries large, greenish. Chiefly eastward; 2°–3° high.

147. Menziesia. (M. globella and globularis.)

LEAF: 1′–2′, simple, alternate, entire, long-obovate, hairy. FLOWER: m., purplish, or greenish-white, small (corolla nearly bell-shaped, 4-lobed, 8 stamens), drooping, in terminal clusters; June; branches hairy. Mountains of Pennsylvania and Virginia; low shrub.

148. Pale Laurel. (Kalmia glauca.)

LEAF: 1′, simple, opposite or whorled, entire, oblong, edge rolled under, white bloom beneath, leathery, almost stemless; branchlets 2-edged. FLOWER: m., lilac-purple, ½′ across (corolla open bell-shaped, 5-lobed, ends of 10 stamens sunk in depressions of corolla), in terminal, few-flowered clusters; May, June. Pennsylvania to Kentucky, and north, in bogs and mountains; 1°–2° high.

149. Sweet-scented Shrub. Carolina Allspice. (Calycanthus nanus.)

LEAF: 3′–5′, simple, opposite, entire, oblong, *bright-green* above, *quite smooth*. FLOWER: dark purple (petals and sepals colored alike, in many rows, thickish, stamens about 12), with strawberry-scent when bruised; single along branch; May–August. Pennsylvania and Virginia, mountains.

150. Sweet-scented Shrub. (Calycanthus floridus.)

LEAF: as in 149, but *oval*, and *downy beneath*. FLOWER: as in 149, but larger; April–August. Perhaps in Virginia mountains; cultivated.

151. Burning-bush. Waahoo. (Euonymus atropurpureus.)

LEAF: 2′–5′, simple, opposite, serrate, long-oval, variable, *rather long stem.* FLOWER: p., dark purple, small (petals and stamens usually 4), 3–6-clustered, lateral, on long stems; June; showy in fall, with crimson seeds exposed. New York to Wisconsin, and south; 6°–14° high; cultivated.

152. Strawberry Bush. (Euonymus americanus.)

LEAF: 1′–2′, simple, opposite, serrate, oval, *very short stem*, bright green, *thickish.* FLOWER: p., greenish-purple or greenish, small (petals and stamens commonly 5), in small, lateral clusters; June; fruit crimson. New York to Illinois, and south, near water; 2°–5° high.

153. False Indigo. (Amorpha fruticosa.)

LEAF: pinnate, alternate; leaflets, 15–25, 1′ long, entire, oval, small-dotted. FLOWER: purple or violet (*one* petal only, surrounding 10 stamens), in crowded, erect, spike-like racemes; June. South Pennsylvania, south and west; 6°–16° high. (Pl. VIII.)

154. Lead-plant. (Amorpha canescens.)

LEAF: as in 153, but leaflets, 31–51, small; whole plant *whitish-hairy.* FLOWER: as in 153, but *blue;* July. Michigan and Wisconsin; 1°–4° high.

155. Shrub Yellow-root. (Xanthorhiza apiifolia.)

LEAF: pinnate or twice pinnate, alternate; leaflets, 3–5, 2′–3′ long, serrate, sometimes lobed, ovate with wedge-shaped base, stemless. FLOWER: p., brownish-purple (petals 5, smaller than the sepals, stamens 5–10), in drooping panicles or racemes, in early spring with the leaves; roots and bark *yellow.* In Southwestern New York, Pennsylvania and Kentucky, and southward in mountains; 1°–3° high. (Pl. VIII.)

156. Oil-nut. Buffalo-nut. (Pyrularia pubera.)

LEAF: 2′–3′, simple, alternate, entire, elliptical, very veiny. FLOWER: greenish, small (no corolla, calyx 5-lobed, stamens 5), in small terminal spikes; May; fruit pear-shaped, 1′ long. Pennsylvania and south, in mountains; 3°–12° high.

157. Common Buckthorn. (Rhamnus cathartica.)

LEAF: 1′–3′, simple, alternate, finely serrate, *ovate*. FLOWER: p., greenish (petals 4, notched at apex, the 4 stamens standing *opposite* (directly before) them; sometimes no petals), clustered along branch; May, June; branchlets thorny. Introduced, but now slightly spontaneous in Eastern States; used for hedges.

158. Lance-leaved Buckthorn. (Rhamnus lanceolata.)

LEAF: 1′–3′, simple, alternate, finely serrate, *lance-shaped* (or oblong on flowering branches). FLOWER: much as in 157, but petals *deeply* notched; May. Pennsylvania to Illinois; not thorny.

159. Alder-leaved Buckthorn. (Rhamnus alnifolia.)

LEAF: 1′–3′, simple, alternate, serrate, oval, apex sharp. FLOWER: greenish, small (*no corolla*, calyx 5-lobed, 5 stamens alternating with calyx-lobes), in clusters along branch, staminate and pistillate commonly on different plants; June. Maine to Pennsylvania and Illinois; 2°–4° high; thornless.

160. Prickly Gooseberry. (Ribes cynosbati.)

LEAF: 1′–2′, simple, alternate, serrate, 3–5-lobed, roundish-heart-shaped. FLOWER: p., greenish, small (petals and stamens 5, style undivided), 1–3-clustered on *slender* stem; stamens not longer than *broad* calyx; May; 1–3 prickles on branch near base of leaf-stem; berry large, brownish-purple, *long-prickly* (rarely none). Commonest northward; 2°–4° high. (Pl. VIII.)

161. Common Wild Gooseberry. (Ribes oxyacanthoides.)

LEAF: 1′–2′, as in 160. FLOWER: as in 160, but stamens scarcely longer than *bell-shaped* calyx; style 2-lobed at apex; 1–2 on *very short* stems; May; branches smooth or prickly; fruit smooth, purple, small. New England to Illinois; moist ground. (Pl. VIII.)

162. Round-leaved Gooseberry. (Ribes rotundifolium.)

LEAF: as in 160, but more roundish, and commonly not cordate. FLOWER: as in 160, but stamens *longer* than *cylindrical* calyx;

style 2-lobed at apex; 1–3-clustered; June; fruit smooth; branches usually prickly. Western Massachusetts to Wisconsin, and south in mountains to Virginia.

163. Swamp Gooseberry. (Ribes lacustre.)

LEAF: as in 160, *deeply* lobed; young shoots with abundant, weak, reddish prickles; old stems somewhat thorny. FLOWER: as in 160, but style 2-lobed at apex; 4–9-clustered, drooping; June; fruit, small, bristly, purple. New England to Wisconsin, and in Pennsylvania.

164. Forestiera. (F. acuminata.)

LEAF: 1′–3′, simple, opposite, finely serrate or entire, long-ovate, base and apex sharp. FLOWER: greenish, or whitish (no corolla, calyx of 4 small, soon-falling sepals, 2–4 stamens); 1–3-clustered; April. West Illinois.

165. Smooth Sumach. (Rhus glabra, with var. laciniata.)

LEAF: pinnate, alternate; leaflets, 11–31, 2′–4′ long, lance-shaped, serrate, whitish beneath, *smooth*, with some bloom. FLOWER: p., whitish, greenish, or greenish-red, small (petals and stamens 5), in erect, dense, pyramidal clusters, which in fruit are crimson; June, July; 3°–15° high. (Pl. VIII.)

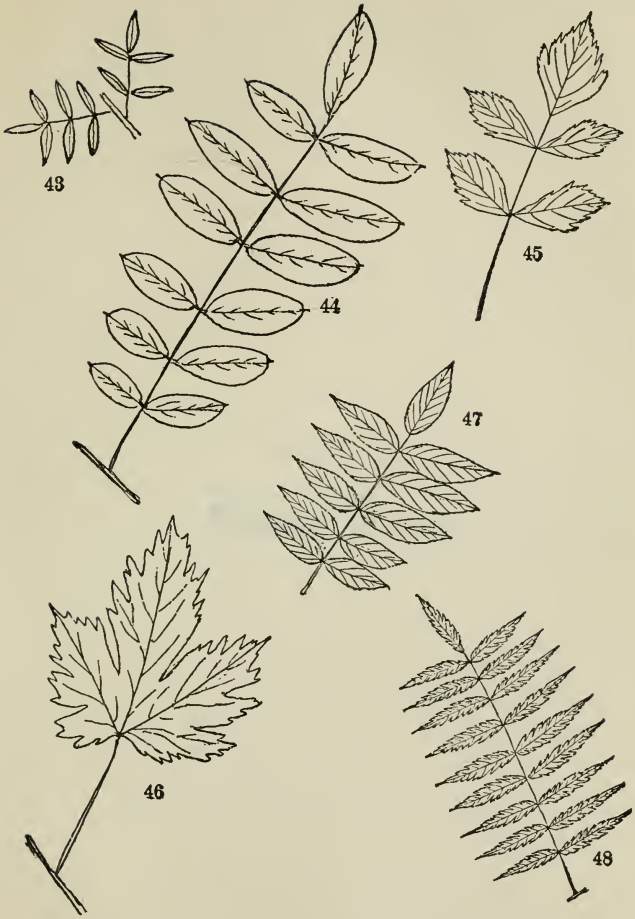
The ornamental cut-leaved sumach is a variety of this species. (Pl. VIII.)

166. Dwarf Sumach. (Rhus copallina.)

LEAF: pinnate, alternate; leaflets, 9–21, 1′–3′ long, ovate to lance-shaped, entire or slightly serrate, *somewhat glossy* above; the stem *broadly margined* between the pairs of leaflets. FLOWER: as in 165; July, August; 1°–7° high; rarely arboreal, 15°–20°. (Pl. IX.)

167. Sweet Gale. (Myrica Gàle.)

LEAF: 1′–1½′, simple, alternate, serrate *toward apex*, long-obovate, base tapering, *fragrant when bruised*. FLOWER: the staminate catkins 1′ or more in length, terminal; the pistillate ¼′ long, oval, lateral; no corolla nor calyx; April, before the leaves. New England, south and west; on edge of fresh water; 2°–5° high. (Pl. IX.)



43. Shrubby Cinquefoil. **141.** (1/4)
44. False Indigo. **153.** (1/2)
45. Shrub Yellow-root. **155.** (1/6)
46. Gooseberry. **161.** (5/6)
47. Smooth Sumach. **165.** (1/6)
48. Cut-leaved Sumach. **165.** (1/6)

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168. Bayberry. Wax-myrtle. (Myrica cerifera.)

LEAF: 1½′–3′, simple, alternate, entire or slightly serrate toward apex, oblong-elliptical, base narrowed, glossy, *fragrant when bruised.* FLOWER: much as in 167, but *after* the leaves; May; seeds in globular, berry-like cones, abundant, coated with white wax, remaining through winter. Sandy soil near sea-coast, and on Lake Erie. (Pl. IX.)

169. Sweet-fern. (Myrica asplenifolia.)

LEAF: 3′–6′, simple, alternate, *many*-lobed, *very narrow*, *fragrant when bruised.* FLOWER: staminate in cylindrical, pistillate in globular, catkins; no calyx nor corolla; April, May, before leaves. In poor soil, often in large masses; 1°–2° high. (Pl. IX.)

170. Low Birch. (Betula pumila.)

LEAF: ½′–1½′, simple, alternate, roundish-toothed, broad-oval or obovate, thickish, young branches and leaves beneath soft, hairy. FLOWER: staminate in pendent, pistillate in erect, catkins, both ½′ to ¾′ long, 2–3 blossoms under each bract; in early spring, before or with leaves. Mountains of New England, also in Connecticut, New Jersey, and west; 2°–8° high. (Pl. IX.)

171. Speckled Alder. Hoary Alder. (Alnus incana.)

LEAF: 2′–4′, simple, alternate, serrate (finely, and often also coarsely), roundish or ovate, base rounded, slightly cordate, or pointed, *whitish* and downy beneath, a little thickish. FLOWER: staminate in slender pendent catkins, 2′–3′ long, pistillate in thick, oval catkins, about ½′ long, catkins of both sorts 3–5 clustered; March, April, before leaves; fruit in short cones. Massachusetts, west and north, in damp soil; 8°–20° high.

172. Smooth Alder. (Alnus serulata.)

LEAF: as in 171, but *green both sides*, base *sharp*, generally smooth. FLOWER: as in 171. Massachusetts, west and south; 5°–15° high. (Pl. IX.)

173. Green Alder. Mountain Alder. (Alnus viridis.)

LEAF: much as in 171. FLOWER: as in 171, but the pistillate formed in *spring* (not *late in previous year*, as is the case with both pistillate and staminate catkins of 171, 172), and the flowers appear *with*, not *before*, the leaves; seeds *winged;* in 171, 172 they are *wingless*. Western Massachusetts, west and north, and in Alleghany Mountains.

174. Hazel-nut. (Corylus americana.)

LEAF: 3′–6′, simple, alternate, serrate, roundish, base slightly cordate, apex slightly tapering. FLOWER: staminate (8 stamens in each) in long pendent catkins; pistillate (one style with 2 stigmas in each), several in a short ovoid catkin; April before leaves; fruit, a hard oval nut, enclosed in a leafy cup of 2 separate, broad, deeply serrate or lobed bracts. (Pl. X.)

175. Beaked Hazel-nut. (Corylus rostrata.)

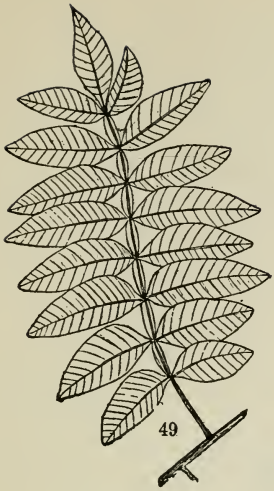
LEAF: as in 174, but often smaller. FLOWER: as in 174, but the leafy bracts around fruit extended in a *long bristly tube* above the nut. Commoner north; 2°–6° high.

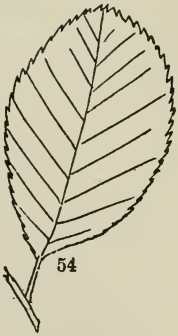
176. Scrub Oak. Dwarf Chestnut Oak. (Quercus Muhlenbergii.)

LEAF: 3′–4′, simple, alternate, coarsely round-toothed or slightly lobed, long-obovate, base sharp, glossy above, whitish or bluish and slightly downy beneath. FLOWER: yellowish green; staminate in slender pendent catkins (calyx 2–8-lobed); pistillate (with 3-lobed stigma) single or few-clustered; in spring. Massachusetts, west and south; 2°–4° high. (Pl. X.)

177. Bear Oak. Black Scrub Oak. (Quercus ilicifolia.)

LEAF: 2′–4′, simple, alternate, about 5-lobed (lobes rounded and *bristle-pointed*), long-obovate, base wedge-shaped, *whitish downy beneath*, thickish. FLOWER: as in 176. New England to Ohio, and south; on sandy or rocky ground; 3°–8° high. (Pl. X.)





49. Dwarf Sumach. **166.** (1/3)
50. Sweet Gale. **167.** (2/3)
51. Bayberry. **168.** (6/6)
52. Sweet Fern. **169.** (2/3)
53. Low Birch. **170.** (1/2)
54. Smooth Alder. **172.** (1/2)

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178. Dwarf Chestnut. Chinquapin. (Castanea pumila.)

LEAF: 3′–5′, simple, alternate, elliptical, sharply serrate, whitish-downy beneath. FLOWER: staminate (8–20 stamens, calyx about 6-lobed) in slender, pendent catkins, 2′–3′ long; pistillate about 3-clustered, forming ovoid prickly mass; flowering *after* leaves; nut single, hardly half as large as common chestnut. New Jersey, south and west; shrub or low tree.

179. Long-leaved Willow. (Salix longifolia.)

LEAF: 2′–4′, simple, alternate, very sparingly serrate, very narrow, base and apex tapering; near water; 2°–20° high. (Pl. X.)

180. Glaucous Willow. (Salix discolor.)

LEAF: 2′–5′, simple, alternate, serrate *except near base and apex*, long-obovate or oblong, apex pointed, with a bloom beneath when mature; 7°–15° high; shrub or low tree.

181. Hoary Willow. Sage Willow. (Salix candida.)

LEAF: 2′–4′, simple, alternate, entire, or slightly serrate at apex, narrow, apex tapering, *very white-downy beneath;* older shoots red; newer whitened; 2°–6° high. New Jersey, west and south.

182. Prairie Willow. (Salix humilis.)

LEAF: 2′–4′, simple, alternate, entire (edge sometimes rolled under), long-obovate, apex sharp, or obovate, apex blunt, *downy beneath; leaf-stem distinct;* open ground, poor soil; 3°–8° high. (Pl. X.)

183. Dwarf Gray Willow. (Salix tristis.)

LEAF: 1′–2′, simple, alternate, entire, narrow, broader at top, apex pointed, whitish-woolly beneath, and also above when young, thick, almost stemless; stipules very small, falling early; 1°–1½° high. (Pl. X.)

184. Silky Willow. Gray Willow. (Salix sericea.)

LEAF: 2′–3′, simple, alternate, finely and evenly serrate, lance-shaped, narrow, *grayish-silky* beneath when young, black when dry; 6°–8° high.

185. Long-stalked Willow. (Salix petiolaris.)

LEAF: as in 184, but not so silky beneath, and when mature with a bloom; not as black when dry; 4°–15° high.

186. Myrtle Willow. (Salix myrtilloides.)

LEAF: 1′–2′, simple, alternate, entire, edge rolled under, elliptical to oblong, very smooth, lighter or with bloom beneath, rather thick. New England, westward, and New Jersey; 1°–3°.

187. Livid Willow. (Salix livida.)

LEAF: 2′–3′, simple, alternate, oblong or long-obovate, apex sharp, scarcely toothed, downy above, *beneath veiny, soft-hairy and with bloom*. New England to Pennsylvania, and west.

188. Dwarf Birch. (Betula glandulosa.)

LEAF: ½′–¾′, simple, alternate, round-toothed, obovate with wedge-shaped base, or quite roundish, thickish, both sides green; branchlets strongly marked with wart-like dots. FLOWER: staminate in long and pendent, pistillate in short, catkins; early spring, before or with leaves. High mountains of northern frontier, and shore of Lake Superior; 1°–4° high.

189. Green Willow. Mountain Willow. (Salix chlorophylla.)

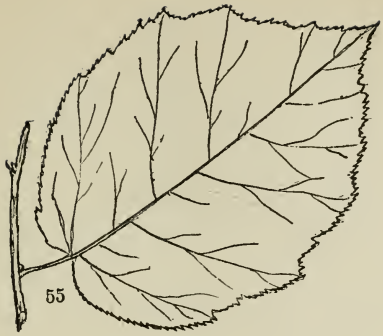
LEAF: 1′–3′, oblong to reverse-lance-shaped, mostly entire, *glossy, very smooth*, leathery when mature. Alpine tops of White Mountains; low, spreading.

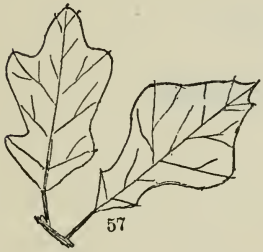
190. Herb Willow. (Salix herbacea.)

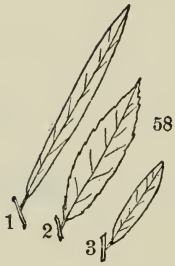
LEAF: 1′, simple, alternate, *roundish*, serrate, base cordate, *apex notched, glossy*. Alpine tops of mountains in New England; smallest willow, branches only one or two inches high from creeping stem.

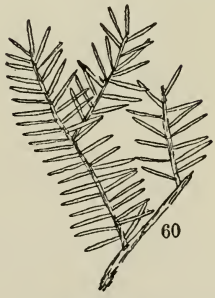
191. Bear-berry Willow. (Salix Uva-ursi.)

LEAF: ¾′, simple, alternate, slightly serrate, elliptical with apex sharp, or obovate and blunt, *glossy*, a little bloom beneath. Alpine tops of mountains in New England and New York; very low shrub.









55. Hazel-nut. **174.** (1/2)
56. Scrub Oak. **176.** (2/5)
57. Bear Oak. **177.** (2/5)
58. Willow Types. { 1. Long-leaved. **179.** (2/5) 2. Prairie. **182.** (1/3) 3. Dwarf Gray. **183.** (1/3)
59. Common Juniper. **194.** (1/4)
60. American Yew. **197.** (1/2)

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192. Silver-fruited Willow. (Salix argyrocarpa.)

LEAF: 1′–2′, simple, alternate, irregularly round-toothed, lance-shaped, base tapering, *beneath long-shining-hairy when young;* "whole plant when young with a glossy satiny lustre." Alpine ravines of White Mountains; 1°–2° high.

193. Balsam Willow. (Salix balsamifera.)

LEAF: 1′–2′, simple, alternate, somewhat ovate, base commonly cordate and broadly rounded; leaf-stem about ½′ long. Maine, and west.

194. Common Juniper. (Juniperus communis.)

LEAF: ⅓′–¾′, prickly, stiff, 3-whorled, spreading, *whitened above*, green below. FLOWER: staminate and pistillate usually on different plants, in very short or ovoid catkins; no calyx nor corolla; fruit berry-like, blackish, ¼′ or more in diameter; "evergreen," usually in low broad clumps (2°–3°), sometimes in pyramidal form (6°–8°). New Jersey, north and west. (Pl. X.)

195. Alpine Juniper. (Juniperus communis, var. alpina.)

Much like 194, but with leaves much shorter and less spreading; plant prostrate. Maine, and shores of Great Lakes.

196. Prostrate Juniper. (Juniperus Sabina, var. procumbens.)

Much like 194, but leaves chiefly opposite, and of two forms: sharp-pointed, as in 194, and flat, scale-like and appressed to stem, as in arborvitæ; fruit as in red cedar, but larger and drooping; plant prostrate or creeping. Maine, and west along Great Lakes.

197. American Yew. Ground Hemlock. (Taxus canadensis.)

LEAF: ½′–⅔′, narrow, flat, stiff, evergreen, green both sides, 2-*ranked* on branch (as in hemlock, but larger). FLOWER: staminate in small globular catkins; pistillate, single; no calyx nor corolla; April, May; fruit red, like a pea. New Jersey, west and north; straggling bush, often in large clumps; 2°-3° high. (Pl. X.)

VINES

Native and naturalized, found in the Northeastern United States (Maine to Virginia, and west to the Mississippi).

ANALYTICAL KEY

Vines widely distributed in above territory, *at least not found exclusively on frontier.*

not prickly nor rough-bristly (those are 84–102).

not "evergreen," *i.e.*, with needles as in hemlock or spruce (those are 103).

not leafless, parasitic (those are 104).

climbing by minute rootlets along the stems; if with tendrils, they terminate, *like the rootlets,* in *sucker-like disks :* 1–4.

climbing by twining tendrils (no sucker-like disks at their ends) :

tendrils growing from the stalk, not from leaf-stems :

leaves simple, serrate (often lobed) : 5–10.

leaves simple, lobed (not serrate) : 11, 12.

tendrils growing only from near the base of leaf-stems : 13–15.

climbing by tendrils from upper end of pinnate leaves:
style thread-like, hairy only at apex: 16 (Vetches).
style flattened, hairy along one side: 17 (Vetchlings).

without tendrils; trailing, or climbing by twining stalks or twisted leaf-stems:

LEAVES SIMPLE:

ALTERNATE (or clustered):

Entire:

trailing: 18–26, 29, 30, 32, 41, 44, 98

twining:

flowers ½′–3′ long: 26–31, 41

flowers less than ½′ long: 32–35, 44, 93–98

Serrate (not lobed): 36–38

Lobed (or angled), not serrate: 26, 28, 29, 39–44

OPPOSITE (or whorled):

Entire:

without milky juice:

twining or climbing: 45–50, 35, 59, 91

trailing: 50–54, 24, 91

with milky juice: 55–58

Serrate: 59–61, 53

LEAVES COMPOUND:

PINNATE (or trifoliate):

Alternate or clustered:

leaflets 3, not serrate; calyx-teeth 5 or more: 62–70

leaflets 3, not serrate: calyx-teeth 4: 70–72

leaflets more than 3 (or if 3, serrate): 73–76, 81–83

Opposite: 77–79

PALMATE: leaflets 5: 80

VINES PRICKLY OR ROUGH-BRISTLY:

stems *densely covered* with minute reversed prickles or rough bristles:

leaves simple, alternate, entire: 84, 85

leaves simple, opposite, serrate: 86

leaves 4–8-whorled: 87–91

stems with scattered, larger prickles:

leaves simple, entire or lobed: 92–98

leaves pinnate or trifoliate: 99–102

"EVERGREEN" VINES: 103

LEAFLESS, PARASITIC VINES: 104

Vines found only on frontier:

In Virginia (and thence westerly more or less):

leaves simple, alternate, entire: 105–107

leaves simple, alternate, serrate or lobed: 107–111

leaves simple, opposite: 112–114

leaves pinnate: 115–119

In Illinois: 120–125

In Kentucky: 126, 127

DESCRIPTION OF NATIVE VINES

Native and naturalized, found in the Northeastern United States (Maine to Virginia, and west to the Mississippi).

For definition of terms see pp. 411–424.

1. American Ivy. Woodbine. Virginia Creeper. (Ampelopsis quinquefolia.)

LEAF: palmate, alternate; leaflets, 3–7 (commonly 5), serrate, (except lower half), elliptical, both ends pointed. FLOWER: greenish, small (petals 5), clustered; July; fruit small berries, dark blue; climbing by short rootlets ending in *flat disks*. (Pl. I.)

2. Poison Ivy. Poison Oak. (Rhus toxicodendron.)

LEAF: pinnate, alternate; leaflets, 3, entire, or irregularly and coarsely notched or lobed, long-ovate, apex pointed. FLOWER: greenish-white, small (petals 5), clustered; June, July; fruit light-brown or white, berry-like; climbing by short rootlets ending in *flat disks*; sometimes a low, erect shrub. (Pl. I.)

3. English Ivy. (Hedera helix.)

LEAF: simple, alternate, 5-lobed or angled (entire near the flowers), thick, leathery, evergreen. FLOWER: greenish-yellow (petals, stamens and styles 5), clustered; August–October. Europe; widely cultivated, and now locally spontaneous. (Pl. I.)

4. Trumpet Flower. Trumpet Creeper. (Tecoma radicans.)

LEAF: pinnate, opposite; leaflets, 7–11, coarsely serrate, ovate to oval, base and apex pointed, 2′–3′ long. FLOWER: scarlet outside, orange inside (corolla funnel-form, 5-lobed), 2½′–3′ long, clustered; June–August; fruit a pod, 5′–6′ long, curved. Pennsylvania to Illinois, and south; cultivated; climbing by short rootlets ending in *flat disks;* woody stems. (Pl. I.)

5. Northern Fox-grape. (Vitis labrusca.)

LEAF: 4′–6′ wide, simple, alternate, serrate, variably lobed, roundish, base cordate, *very woolly both sides when young* (as also branchlets), continuing *rusty woolly beneath.* FLOWER: greenish, small, clustered; June; berries large, purple or amber, with musky flavor; with clasping tendrils growing from branch; tendril or flower-cluster opposite *every* leaf; in all other grapes, intermittent; eastward. (Pl. I.)

6. Summer Grape. (Vitis æstivalis.)

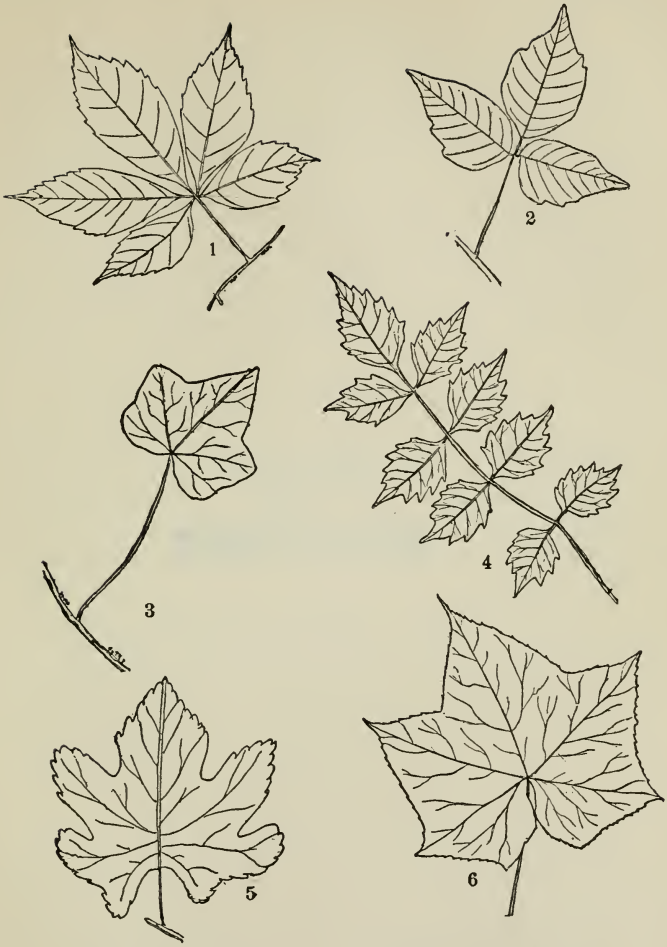
LEAF: 4′–7′ wide, simple, alternate, coarsely serrate, commonly 3–5-lobed, roundish, base cordate, downy beneath at first, then *smoothish* and whitish. FLOWER: greenish, in long clusters; June; berries small, black, with bloom; tendrils from stalk. (Pl. I.)

7. Winter Grape. Frost Grape. (Vitis cordifolia.)

LEAF: 3′–5′ wide, simple, alternate, coarsely serrate, often a little 3-lobed, roundish, base cordate, apex sharp, *green both sides*, thin, ribs beneath usually hairy. FLOWER: in large, loose clusters, very fragrant; May, June; berries small, black or blue, with bloom, very sour until after frost; tendrils from stalk.

8. Southern Fox-grape. Muscadine. (Vitis rotundifolia.)

LEAF: 2′–3′ wide, simple, alternate, coarsely serrate, rarely lobed (slightly), roundish, base cordate, glossy both sides. FLOWER: in small dense clusters; May; berries large, musky, purplish, no bloom, tough-skinned; bark not "shreddy" as in other grapes. Maryland, west and south; tendrils from stalk.



1. Virginia Creeper. **1.**
2. Poison Ivy. **2.**
3. English Ivy. **3.**
4. Trumpet Creeper. **4.** (1/6)
5. Grape Type. **5, 6.** (1/3)
6. Bur Cucumber. **10.** (2/6)

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9. River Grape. (Vitis riparia.)

LEAF: 3′–5′ wide, simple, alternate, coarsely serrate, rather deeply 3-lobed, roundish, base cordate, rather glossy, green both sides, ribs and stem short-hairy; May, June; berries small, with thick bloom. Western New England to Pennsylvania, and west; tendrils from stalk.

10. One-seeded Bur-cucumber. (Sicyos angulatus.)

LEAF: 3′–5′ wide, simple, alternate, serrate, 5-lobed or angled (lobes pointed), roundish, base cordate, whole plant hairy. FLOWER: whitish, small (petals and stamens 5), clustered; July–September; fruit bristly; tendrils growing from stalk; herbaceous; cultivated for screens. (Pl. I.)

11. Wild Balsam Apple. (Micrampelis lobata.)

LEAF: 5′, simple, alternate, deeply 5-lobed (lobes not serrate), base cordate, thin. FLOWER: greenish-white, small (petals 6, lance-shaped, spreading, stamens 3), staminate in long (often 1°) clusters; pistillate, few-clustered or single; July–October; fruit oval, 2′ long, weak-prickly. West New England to Wisconsin, and Kentucky; tendrils growing from stalk; cultivated, herbaceous. (Pl. II.)

12. Yellowish Passion-flower. (Passiflora lutea.)

LEAF: 2′–3′, simple, alternate, 3-lobed near apex, *lobes entire*, with stipules. FLOWER: greenish-yellow, 1′ broad (sepals, petals, and stamens 5), single or paired; July–September; fruit dark purple, ½′ diameter. South Pennsylvania, west and south; tendrils growing from stalk; herbaceous. (Pl. II.)

13. Carrion-flower. (Smilax herbacea.)

LEAF: 2′–5′, simple, alternate, entire, roundish-ovate, apex pointed, base usually cordate, 7–9-veined beneath, smooth (with a downy variety), leaf-stem 1′–3′ long. FLOWER: greenish or yellowish, small, malodorous (sepals and stamens 6, no petals), clusters often large (40–80); May, June; berries blackish with bloom; tendrils from leaf-stems; herbaceous; no prickles. (Pl. II.)

14. Yellowish Carrion-flower. (Smilax tamnifolia.)

LEAF: as in 13, but narrower to lance-shaped, 5–7-veined. FLOWER: as in 13, but clusters smaller (10–20-flowered). New Jersey, and south; tendrils as in 13; no prickles.

15. Laurel-leaved Smilax. (S. laurifolia.)

LEAF: 2′–5′, simple, alternate, entire, lance-shaped to narrow, thickish, evergreen, smooth. FLOWER: as in 13, but not malodorous, 6–30-clustered; June–August; berries *black*. New Jersey, south; tendrils from leaf-stem; seldom prickly; woody vine. (Pl. II.)

16. Vetches. (Vicia.) (Pl. II.)

In six species, all with pinnate alternate leaves; leaflets entire, small, main leaf-stem *ending in a tendril;* flower small, pea-shaped, one- to many-clustered; fruit a flat, oblong pod; in all these points the vetches are like the vetchlings (17); the differences are: in vetches, leaflets are 4–12-paired, 1′ or less in length and the style *thread-like*, and hairy *only at apex;* in vetchlings, leaflets are 1–6-paired, usually 1′–2′ long, and the style *flattened* and hairy *along one side*.

The six species of vetches are distinguished as follows:

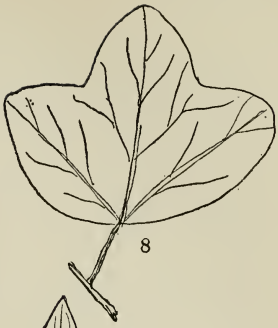
COMMON VETCH (V. sativa): *leaflets* 10–14, long-obovate to linear, apex notched and bristle-pointed, ⅔′–1′ long; *flower* violet-purple, ½′ long, almost stemless, single or paired; June.

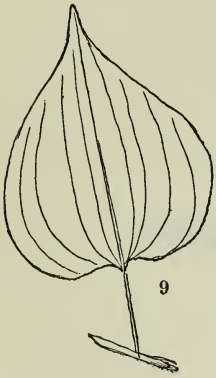
FOUR-SEEDED VETCH (V. tetrasperma): *leaflets* 8–12, narrow, apex blunt, ½′–⅝′ long; *flower* whitish, very small, with stem, single or paired; July. New England to New Jersey, near coast.

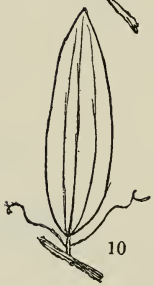
HAIRY VETCH (V. hirsuta): *leaflets* 12–16, apex square, ¼′–⅔′ long; *flower* pale bluish, small, 3–6-clustered; June; pod hairy. Massachusetts to Virginia; a slender, creeping, hairy vine.

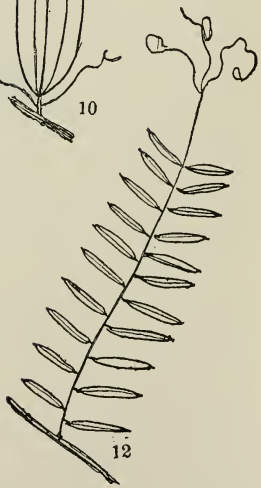
TUFTED VETCH (V. cracca): *leaflets* 20–24, rather lance-shaped, apex bristle-pointed, ½′–⅔′ long, downy; *flower* blue, then purple, ½′ long, in long, close, *one-sided* clusters; July. New England to Kentucky, and north; somewhat rare.

CAROLINA VETCH (V. caroliniana): *leaflets* 8–16, usually alternate, rather oblong, ½′–1′ long, apex variable; *flower* whitish









7. Wild Balsam Apple. **11.** (1/4)
8. Yellow Passion Flower. **12.** (2/3)
9. Carrion Flower. **13.** (1/2)
10. Laurel-leaved Smilax. **15.** (2/5)
11. Trailing Arbutus. **18.** (1/2)
12. Vetch Type. **16.** (1/2)

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(keel blue-edged), very small, 6–12-clustered ; May. New York, south and west.

American Vetch (V. americana): *leaflets* 10–14, elliptical, apex blunt, about 1′ long ; *flower* purplish, ⅔′ long, 4–8-clustered ; May, June. New York, New Jersey, and west.

17. Vetchlings. (Lathyrus.) (Pl. III.)

Leaf and flower essentially as in the vetch (16), where the differences of the two genera are noted. The six species of vetchlings are distinguished as follows :

Swamp Vetchling (L. palustris) : *leaflets* 4–8, narrow, apex pointed, 1′–2′ long, stipules small, lance-shaped, both ends pointed ; *flower* purplish, ½′ long or more, 2–6-clustered ; June, July ; square stem, usually *winged* on edges. New England to New Jersey, and west.

Veiny Vetchling (L. venosus): *leaflets* 8–14, long-oval, 1½′–2′ long ; stipules very small, slender, apex pointed, base half-arrow-shaped ; *flower* purple, many-clustered ; June, July ; stem square. Pennsylvania, west and south.

Myrtle-leaved Vetchling (L. myrtifolius): *leaflets* 4–8, ovate to oblong, about 1′ long ; upper stipules rather large ; *flower* purplish, 3–5-clustered ; July ; square stalk more or less winged. West New England to Virginia.

Spreading Vetchling (L. pratensis) : *leaflets two*, narrow, apex sharp, about 1′ long ; stipules half as long or more, ends long-pointed ; *flower* yellow, few-clustered. Massachusetts and New York ; introduced.

Yellow-white Vetchling (L. ochroleucus) : *leaflets* 6–10, oval to ovate, 1′–1½′ long ; *stipules large*, half cordate ; *flower* yellowish-white, 7–10-clustered ; June, July ; New Jersey, west and north ; rare.

Beach-pea (L. maritimus) . *leaflets* 6–12, oval to ovate, thick, 1′–2′ long, lowest the largest ; stipules *almost as large as leaflets*, rather ovate, base cordate, often serrate ; *flower* purple or blue, large, 6–10-clustered ; June–August ; stem square. New England to New Jersey, on coast.

The Sweet Pea is a vetchling.

18. Trailing Arbutus. Mayflower. (Epigæa repens.)

LEAF: 2′–2½′, simple, alternate, entire, ovate to roundish, base cordate, thick, evergreen, rather coarse, the plant rusty-hairy. FLOWER: rose-colored, fragrant (corolla 5-lobed, spreading, *hairy within*), clustered, on short stems; April, May; commoner eastward; trailing; woody. (Pl. II.)

19. Small Cranberry. (Vaccinium oxycoccus.)

LEAF: ¼′ or less, simple, alternate, entire, edge rolled under, ovate, apex sharp, whitish beneath, evergreen. FLOWER: rose-color, on slender stems (petals 4, narrow, rolled back, stamens 8); June; berry ⅓′ long, almost globular, red, hardly edible. New England to Pennsylvania, and west, in bogs; trailing, woody. (Pl. III.)

20. Large Cranberry. American Cranberry. (Vaccinium macrocarpon.)

LEAF: ⅓′–½′, simple, alternate, entire, oval or obovate, apex *blunt*, evergreen, whitish beneath. FLOWER: as in 19; June; berry red, ½′–1′ long, roundish, acid, edible. Eastern States, swamps; trailing, woody.

21. Bearberry. (Arctostaphylos Uva-ursi.)

LEAF: 1′, simple, alternate, entire, obovate, base tapering, smooth, thick, evergreen. FLOWER: whitish (corolla urn-shaped, 5-toothed, hairy inside), in small pendent clusters; May; berry red, small, sour. New Jersey, west and north; trailing.

22. Cowberry. (Vaccinium Vitis-Idæa.)

LEAF: 1′ or less, simple, alternate, entire, obovate, edge rolled under, evergreen, *dark*, *glossy*, blackish-bristly beneath. FLOWER: whitish (corolla bell-shaped, 4-lobed), in short pendent racemes; June; berry dark red, acid; erect short branches from trailing stem. New England (mountains), Maine coast, locally in Massachusetts.

23. Creeping Snowberry. (Chiogenes serpyllifolia.)

LEAF: ⅓′, simple, alternate, entire, ovate or oval, apex sharp, edge rolled under, *rusty-hairy* beneath (*as also branches*), evergreen, with flavor of birch. FLOWER: white, small (corolla bell-shaped, 4-lobed, 8 stamens, 2 small bracts under calyx), single; May; fruit a white berry ¼′ diameter, edible. In damp woods; woody, trailing. (Pl. III.)

24. Pyxie. Flowering Moss. (Pyxidanthera barbulata.)

LEAF · ¼′ or less, simple, alternate or opposite, entire, narrow, apex sharp, evergreen. FLOWER: white or rosy, bell-shaped, single (corolla 5-lobed, 5 stamens, anthers slender-pointed at base), ¼′ across, stemless; numerous; April, May; short trailing evergreen. New Jersey, and south. (Pl. III.)

25. Breweria. (B. pickeringii.)

LEAF: 1′–1½′, simple, alternate, entire, very narrow (or lowest broader at apex, base tapering). FLOWER: white, ⅓′–½′ across (corolla bell-shaped, 5-lobed, 5 stamens, sepals very hairy, stamens and style longer than corolla), 1–3-clustered on long stem with leaf-like bracts; summer. New Jersey, west and south; trailing, herbaceous.

26. Wild Potato-vine. (Ipomœa pandurata.)

LEAF: 2′–3′, simple, alternate, entire (or sides contracted more or less into fiddle-shape), heart-shaped, apex sharp. FLOWER: white, purple inside (corolla funnel-form, sepals smooth), 3′ long, 1–5-clustered; June–August. Connecticut, west and south; trailing and twining. (Pl. III.)

27. Common Morning-glory. (Ipomœa purpurea.)

LEAF: 2′–4′, simple, alternate, entire, base cordate, apex sharp. FLOWER: purple, rosy or white, 2′ long (corolla funnel-form, *no* bracts at base of calyx), 2–5-clustered; July–September; stalk rough-hairy; twining; herbaceous; introduced, but spontaneous around houses. (Pl. III.)

28. Wild Cypress-vine. (Ipomœa coccinea.)

LEAF: 2′–3′, simple, alternate, entire or slightly lobed or angled, base cordate, apex sharp. FLOWER: scarlet, occasionally yellowish, 1′ long (corolla tubular with flat border, stamens protruding), about 5-clustered; twining; herbaceous. Middle States, Virginia, and south. (Pl. IV.)

29. White Star-ipomœa. (I. lacunosa.)

LEAF: 2′, simple, alternate, entire or lobed, heart-shaped, apex sharp. FLOWER: white (or purple-edged), bell-shaped (corolla 5-lobed, ½′–1′ long, sepals *pointed and hairy*, no leafy bracts at base of calyx), 1–3-clustered; August, September. Pennsylvania to Illinois, and south; twining and trailing; herbaceous.

30. Field Convolvulus. (C. arvensis.)

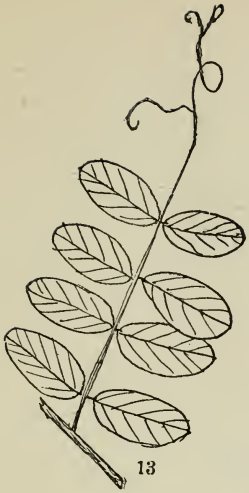
LEAF: 2′–4′, simple, alternate, entire, somewhat arrow-shaped, the projections at base *sharp*. FLOWER: white or reddish-tinged (corolla funnel- to bell-shaped, ¾′ long), mostly single; June, in old fields. Maine to Virginia; twining or trailing (sometimes erect). (Pl. IV.)

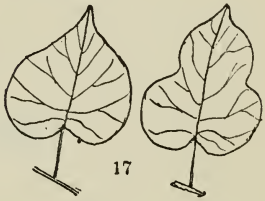
31. Pipe-vine. Dutchman's Pipe. Wild Ginger. (Aristolochia sipho.)

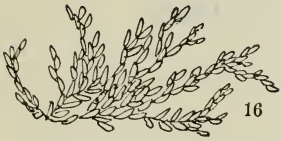
LEAF: 6′–12′ across, simple, alternate, entire, roundish, base cordate. FLOWER: brownish (no corolla, calyx 1½′ long, tubular, *bent*, with brownish-purple *flat border*), single or paired; May, June. Pennsylvania to Kentucky, and south; cultivated; twining, woody. (Pl. IV.)

32. Black Bindweed. (Polygonum convolvulus.)

LEAF: 1′–2′, simple, alternate, entire, halberd-shaped, base cordate; stalk a little rough, not prickly; base of sheathing stipules not bristle-fringed. FLOWER: whitish, or greenish-rosy-tinted, small (no corolla, calyx 4–5-parted, 3 outer lobes *keeled* or angled), in short racemes; July, August; seed not glossy. Eastern States; climbing and trailing.







13. Vetchling Type. **17.** (1/3)
14. Small Cranberry. **19.** (5/6)
15. Creeping Snowberry. **23.** (1/2)
16. Pyxie. **24.** (1/2)
17. Wild Potato-vine. **26.** (2/5)
18. Morning Glory. **27.** (2/5)
19. Small Morning Glory. **40.** (1/2)

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33. Bristly-jointed Bindweed. (Polygonum cilinode.)

LEAF: 1′–2′, simple, alternate, entire, heart-shaped, apex tapering; base of sheathing stipules *bristle-fringed.* FLOWER: as in 32, but outer calyx-lobes very slightly keeled; July to September; seed glossy; twining.

34. Climbing False Buckwheat. (Polygonum scandens.)

LEAF: 2′–3′, simple, alternate, entire, heart-shaped, apex pointed; sheathing stipules *unfringed.* FLOWER: as in 32, but the clusters commonly *leafy;* seed glossy; fruit is margined, as in elm-seeds, pink and quite showy; climbs higher than 33. (Pl. IV.)

35. Wild Yam-root. (Dioscorea villosa.)

LEAF: 3′, simple, mostly alternate (sometimes nearly opposite or whorled), entire, heart-shaped, strongly pointed, somewhat downy beneath. FLOWER: greenish-yellow, very small (no corolla, calyx deeply 6-lobed, 6 stamens, 3 styles), in pendent racemes and panicles; July. Commoner southward; twining.

36. Wintergreen. Checkerberry. (Gaultheria procumbens.)

LEAF: 1′–1½′, simple, alternate, slightly serrate, oval to obovate, evergreen, glossy, thick, aromatic. FLOWER: white (corolla rather ovoid, apex 5-toothed), mostly single, on short (3′–5′), erect, leafy branches from trailing stem; July–September; berry red, edible. Commoner northward. (Pl. IV.)

37. False Violet. (Dalibarda repens.)

LEAF: 1′–2′, simple, alternate or clustered, round-toothed, roundish, base cordate, downy, slender stem (1′–3′). FLOWER: white (petals 5, obovate, spreading, stamens many, styles 5–10, long), single (or two), on a long stem; June–August. Pennsylvania, and north, in woods; short, herbaceous, trailing.

38. Bitter-sweet. Wax-work. (Celastrus scandens.)

LEAF: 2′–3½′, simple, alternate, finely serrate, oval to long-ovate, apex pointed, smooth. FLOWER: greenish, small (petals

and stamens 5), clustered; June; pods orange with scarlet seeds; showy till into winter; twining, woody. (Pl. V.)

39. Moonseed. (Menispermum canadense.)

LEAF: 4′–5′, broad, simple, alternate, 3–7-lobed or angled, not serrate, roundish, base cordate. FLOWER: white, small (petals 6–8, stamens 12–24), in loose panicles; June, July; fruit black, like a small grape; near water; twining, woody. (Pl. IV.)

40. Small Morning-glory. (Ipomœa hederacea.)

LEAF: 2′–3′, simple, alternate, usually 3-lobed, lobes pointed, not serrate, broad-ovate, base cordate. FLOWER: purple, rosy, or white (corolla funnel-form, 1′–1½′ long, calyx hairy), 1–3-clustered; July–September. Pennsylvania, and south; cultivated; stalk hairy, trailing or twining herbaceous. (Pl. III.)

41. Hedge Bindweed. Rutland Beauty. (Convolvulus sepium.)

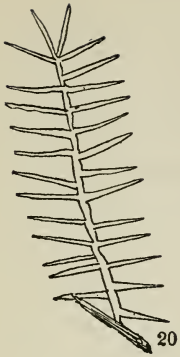
LEAF: 2′–4′, simple, alternate, often slightly lobed on the base, not sharply serrate, often entire, halberd-shaped, apex sharp, projection at base squarish, often irregular. FLOWER: white or rosy, 1½′–2′ long (corolla funnel-form, edge entire or slightly lobed, 2 *large leafy bracts* at base of calyx), single; June–August; near water; twining or trailing; herbaceous.

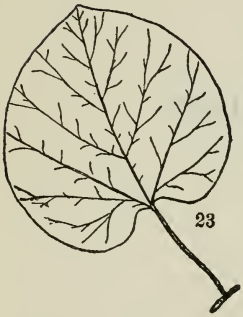
42. Cypress-vine. (Ipomœa vulgaris.)

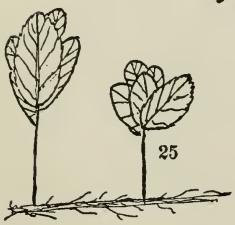
LEAF: 2′–4′, simple, alternate, *deeply* lobed into linear divisions, feathery. FLOWER: scarlet, with a white variety (corolla tubular, with a flat, slightly lobed border), single; in summer. Introduced, slightly spontaneous, southerly; cultivated; twining; herbaceous. (Pl. IV.)

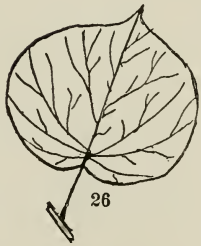
43. Climbing-Fern. (Lygodium palmatum.)

LEAF: 1′–2′, simple, alternate in pairs, 4–7-lobed, not serrate, roundish, base cordate; no flowers; fruit, in double rows of dots on back of very small leaves narrowly lobed, at the ends of stems. Massachusetts to Virginia, and Kentucky; rare, climbing. (Pl. V.)









20. Cypress Vine. **42.** ($^1/_2$)
21. Wild Cypress Vine. **28.** ($^2/_5$)
22. Field Convolvulus. **30.** ($^1/_3$)
23. Pipe Vine. **31.** ($^1/_7$)
24. Climbing False Buckwheat. **34.** ($^2/_9$)
25. Wintergreen. **36.** ($^2/_5$)
26. Moonseed. **39.** ($^1/_4$)

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44. Woody Nightshade. Bittersweet. (Solanum dulcamara.)

LEAF: 2′–3′, simple, alternate, mostly 2-lobed at base (lobes sometimes like distinct leaflets), occasionally entire, not serrate, long-ovate, base cordate, apex sharp. FLOWER: blue or purple (corolla 5-parted, spreading, whitish-spotted, stamens 5), small-clustered; June–September; fruit berry-like, oval, scarlet. Spontaneous in Pennsylvania; cultivated; woody, climbing or trailing. (Pl. V.)

45. Trumpet Honeysuckle. (Lonicera sempervirens.)

LEAF: 2′–3′, simple, opposite, entire, oblong and variable, lower with stems, upper pairs grown together around stem. FLOWER: red (rarely yellowish) outside, yellowish inside (corolla trumpet-shaped, 5-lobed, 2′ long), odorless, in whorled clusters; May–September. Connecticut, west and south; cultivated, twining.

46. Yellow Honeysuckle. American Woodbine. (Lonicera grata.)

LEAF: 2′–3′, simple, opposite or 3-whorled, entire, obovate, upper pairs grown together, evergreen, *bloom beneath*. FLOWER: whitish above, purple or red below, finally all yellowish (corolla funnel-shaped, 1½′ long, upper lip 4-lobed, lower lip narrow), fragrant, in whorled clusters; May, June. New York, west and south; cultivated, twining.

47. Yellow Honeysuckle. (Lonicera Sullivantii.)

LEAF: 2′–4′, simple, opposite, entire, obovate to oval, *bloom both sides*, *thickish*, dull green, many pairs grown together. FLOWER: light yellow, tube ½′ long (corolla-lips as in 46), fragrant, about 10-clustered; May–July. New York, south and west; low climbing.

48. Small Honeysuckle. (Lonicera glauca, with var. douglasii.)

LEAF: 2′–3′, simple, opposite, entire, oblong, *much bloom beneath*, many pairs united, others stemless. FLOWER: greenish-yellow (often purple- or red-tinged), ¾′ long corolla-lips as in

46, tube ⅓′, hairy within, in 2 or 3 adjacent whorls ; May, June. Pennsylvania, west and north ; climbing 3°–5°.

The Douglas variety has greener leaves, downy beneath or hairy-edged when young, and crimson or purple blossoms ; Ohio and west.

49. Hairy Honeysuckle. (Lonicera hirsuta.)

LEAF : 3′–4′, simple, opposite, entire, broad-oval, hairy below, usually so above and on edge, higher pairs joined, lower short-stemmed, branches hairy. FLOWER : orange-yellow, *sticky* (corolla-lips as in 46, tube about ½′ long, bulging at base), in adjacent whorls ; July. Pennsylvania, west and north ; coarse, large-leaved climber.

50. Japanese Honeysuckle. (Lonicera japonica.)

LEAF : 1′–2½′, simple, opposite, entire, never joined, obovate to oval, dark green till into winter ; branchlets hairy. FLOWER : white, then light-yellow, in pairs, 1½′ long, fragrant (corolla-lips as in 46, tube hairy in- and out-side) ; June, July. Cultivated, and becoming spontaneous ; twining and trailing.

51. Creeping Phlox. (P. reptans.)

LEAF : 1′–2′, simple, opposite, entire ; roundish and thickish on the creeping runners, oblong (½′) on flowering upright stems (4′–8′), latter leaves fine-hairy. FLOWER : reddish-purple (corolla with long tube (1′), and flat, 5-lobed border (almost 1′), the lobes somewhat roundish), clustered at summit of stems ; May, June. Pennsylvania and Kentucky, and south ; trailing, herbaceous.

52. Partridge-berry. (Mitchella repens.)

LEAF : ½′ or more, simple, opposite, entire, roundish-ovate, base slightly cordate, *evergreen*, *glossy*, smooth. FLOWER : white or purple-tinged, ½′ long, in pairs, fragrant (corolla funnel-form, its 4 lobes spreading, hairy inside, stamens 4) ; June, July ; fruit, a red, rather tasteless berry, *double*, resulting from the pair of flowers, surmounted with 2 sets of calyx-teeth, lasting into winter ; small, woody, trailing. (Pl. V.)

27. Climbing Fern. **43.** (2/3)
28. Bittersweet (Celastrus scandens). **38.** (Av. size.)
29. Moody Nightshade. **44.** (Av. size.)
30. Partridge-berry. **52.** (1/2)
31. Twin-flower. **53.** (1/2)
32. Moneywort. **54.** (1/2)

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53. Twin-flower. (Linnæa borealis.)

LEAF: 1′, simple, opposite, entire or obscurely round-toothed or wavy-edged, roundish or oval, evergreen, somewhat hairy. FLOWER: rose or purple to whitish, fragrant, pendent in pairs on long stem (corolla rather bell-shaped, 5-lobed, hairy inside, stamens 4); June. South to New Jersey and in mountains to Maryland, and west; herbaceous, trailing. (Pl. V.)

54. Moneywort. Creeping-Charlie. (Lysimachia nummularia.)

LEAF: 1′, simple, opposite, entire, roundish, smooth, short-stemmed, base often slightly cordate. FLOWER: yellow, large (1′ across), single (corolla deeply 5-lobed, spreading, lobes almost roundish, stamens 5); July–September. Introduced, becoming spontaneous; trailing, herbaceous. (Pl. V.)

55. Enslenia. (E. albida.)

LEAF: 3′–5′ broad, simple, opposite, entire, ovate, base cordate, apex sharp, long-stemmed. FLOWER: whitish, small (corolla 5-parted, lobes erect), in lengthened clusters; July–September. Ohio to Illinois, and south; river-banks; twining, herbaceous; milky juice.

56. Black Vincetoxicum. Black Milkweed. (V. nigrum.)

LEAF: 2′, simple, opposite, entire, ovate or oblong-ovate. FLOWER: dark purple, small (corolla 5-parted, lobes spreading, stamens 5, anthers adhering to stigma, a 5–10-lobed flat, fleshy disk in centre), clustered. New England to Pennsylvania; more or less twining, herbaceous, milky juice.

57. Rough-fruited Milkweed. (Gonolobus obliquus.)

LEAF: 3′–8′, simple, opposite, entire, heart-shaped, apex sharp, stem and stalk *quite hairy*. FLOWER: greenish outside, crimson-purple inside (corolla 5-parted, spreading, 1′ across, or less, lobes narrow), many-clustered; July–September; pod 5′ long, rough-pointed. Pennsylvania, south and west, near streams; twining or trailing, herbaceous, milky juice.

58. Twining Milkweed. Periploca. (P. græca.)

LEAF: 3′–4′, simple, opposite, entire, ovate or long-ovate, apex pointed. FLOWER: dark purple (corolla 5-parted, lobes spreading, narrow, *very hairy inside*, filaments of stamens distinct, a 5-lobed crown in centre, each lobe *bristle-tipped*), long-clustered; August. Locally in Western New York, cultivated; twining, woody, milky juice.

59. Climbing Hempweed. Climbing Boneset. (Mikania scandens.)

LEAF: 2′–3′, simple, opposite, serrate at base (sometimes entire), long-heart-shaped, apex pointed; leaf-stem usually 1′–2′ long. FLOWER: flesh-colored to dull purple, small (corolla tubular, 5-toothed, stamens 5), in 4-flowered "heads" having 4 bracts at base, many "heads" clustered together; July–September. New England, south, near water; rather rare; twining, herbaceous. (Pl. VI.)

60. Gill. Ground-ivy. (Nepeta Glechoma.)

LEAF: 1′, simple, opposite, round-toothed, roundish, base heart-shaped, with stem. FLOWER: light blue (corolla tubular below, an upper lip erect, notched, a lower lip spreading, 3-lobed, stamens 4), 1–3-clustered; May–August; in damp ground; trailing, herbaceous, stem square. (Pl. VI.)

61. Trailing Strawberry-bush. (Euonymus obovatus.)

LEAF: 2′, simple, opposite, serrate, rather obovate, base pointed, apex usually so. FLOWER: greenish-purple, small (petals, sepals, and stamens 4–5, petals separate, rounded), about 3-flowered on long stem; June; pod splitting and showing scarlet seeds. New York, west and south, in damp ground; branchlets 4-angled; usually trailing, woody, rooting at joints.

62. Wild-bean. Kidney-bean. (Phaseolus polystachyus.)

LEAF: pinnate, alternate; leaflets, 3, 1½′–3½′ long, round-ovate, apex sharp. FLOWER: purplish, small, sweet-pea-shaped (calyx 5-toothed), in lengthened loose clusters; July, August; pod 2′ long, *curved;* twining or trailing, herbaceous. (Pl. VI.)

63. Various-leaved Kidney-bean. (Phaseolus helvolus.)

LEAF: pinnate, alternate; leaflets, 3, ½′–3′ long, ovate to long-ovate, entire or 3-lobed. FLOWER: greenish-white, red- or purple-tinged, sweet-pea-shaped (calyx 5-toothed), few-clustered on long stem; August, September; pod about straight. Massachusetts, and south, on coast, and along Great Lakes: twining and trailing, herbaceous.

64. Umbelled Kidney-bean. (Phaseolus umbellatus.)

LEAF: pinnate, alternate; leaflets, 3, about 1′ long, ovate to lance-shaped, rarely lobed. FLOWER: sweet-pea-shaped (calyx 5-toothed), almost stemless, few-clustered; pod about straight, nearly 2′ long, very narrow. Long Island, south and west, in sandy soil; twining or trailing, herbaceous.

65. Spurred Butterfly-pea. (Centrosema virginianum.)

LEAF: pinnate, alternate; leaflets, 3, 1′ long or more, long ovate to linear, glossy; stalk rough-hairy. FLOWER: violet pea-shaped, 1′ long (spur near base, calyx 5-toothed), 1–4-clustered; July; pod straight, 4′–5′. Maryland, and south; twining, herbaceous.

66. Butterfly-pea. (Clitoria mariana.)

LEAF: pinnate, alternate; leaflets, 3, 1′ long, long-ovate to lance-shaped. FLOWER: blue or purple, with some whitish, showy, 2′ long, pea-shaped, not spurred (calyx 5-toothed), 1–3-clustered; July, August; pod 1½′–2′, narrow, flat. East New York, New Jersey, south and southwest; twining, sometimes creeping, woody at base.

67. Bush-trefoil. Tick-trefoil. (Desmodium rotundifolium.)

LEAF: pinnate, alternate; leaflets, 3, 1′–2′ long, roundish, entire, stipules prominent, ovate, pointed; *leaf and stalk hairy.* FLOWER: purple, pea-shaped (calyx 5-toothed), few-clustered; August; pod 2–6-jointed, edge deeply lobed, covered with hooked hairs; trailing, herbaceous. (Pl. VI.)

68. Smooth Bush-trefoil. (Desmodium humifusum.)

LEAF: as in 67, but almost smooth, and leaflets less round, stipules smaller and narrow. FLOWER: as in 67. Maine, Pennsylvania, south.

69. Bush-clover. (Lespedeza procumbens.)

LEAF: pinnate, alternate; leaflets, 3, ½′–¾′ long, roundish to obovate, smooth above, *rest of plant downy*. FLOWER: purplish, pea-shaped, larger and smaller on some plant (latter often without petals, calyx 5-toothed), few-clustered; August, September; pod roundish, flat, one-celled; trailing, herbaceous.

70. Hog-peanut. (Amphicarpæa commosa.)

LEAF: pinnate, alternate; leaflets, 3, ½′–3′ long, ovate-rhombic. FLOWER: purplish-white, small, pea-shaped (calyx 4-(rarely 5-)toothed), a *bract under each* 2 or more, clustered; August, September; twining, hairy, herbaceous. (Pl. VI.)

71. Milk-pea. (Galactia regularis.)

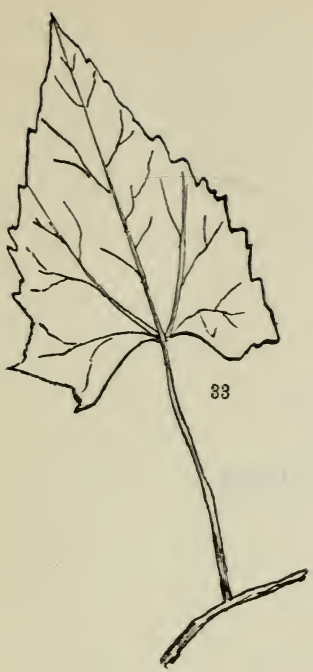
LEAF: pinnate, alternate; leaflets, 3, 1′–1⅔′ long, long-ovate to elliptical, sometimes notched at both ends, a little hairy beneath. FLOWER: rose-purple, small, pea-shaped (calyx 4-toothed), 4–8-clustered; pod 1½′, narrow, flat, hairy; July. New York and south; trailing, herbaceous.

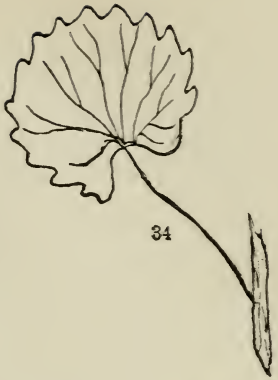
72. Downy Milk-pea. (Galactia pilosa.)

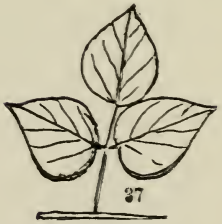
LEAF: pinnate, alternate; leaflets, 3, ½′–1′ long, oval, whitish-hairy beneath, as also stalk. FLOWER: purplish, small, pea-shaped (calyx 4-toothed), in rather large long clusters; July; pod very downy. Pennsylvania, and south; twining or trailing; herbaceous.

73. Ground-nut. Wild Bean. (Apios tuberosa.)

LEAF: pinnate, alternate; leaflets, 5–7, 1½′–2′, ovate-lance-shaped. FLOWER: brownish-purple, odorous, pea-shaped, in dense clusters; August, September; twining, herbaceous, with a little milky juice. (Pl. VII.)







33. Climbing Hempweed. **59.** (Av. size.)
34. Gill. **60.** (Av. size.)
35. Wild Bean. **62.** (1/4)
36. Bush Trefoil. **67.** (1/3)
37. Hog Peanut. **70.** (1/2)

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74. Climbing Fumatory. Mountain Fringe. (Adlumia fungosa.)

LEAF: twice pinnate, alternate; ultimate leaflets mostly in threes, delicate, usually 2–3-lobed. FLOWER: white or purplish (petals 4, joined *in pairs*, sepals 2, stamens 6), pendent, in large panicles; June–October. Often cultivated, delicate, climbing by leaf-stems, herbaceous. New York, west and south. (Pl. VII.)

75. Dwarf Raspberry. (Rubus triflorus.)

LEAF: pinnate, alternate; leaflets, 3–5, 1′–2′ long, serrate, long- or broad-ovate, base and apex pointed, thin, smooth. FLOWER: white, small (petals 5–7, erect, stamens many), 1–3-clustered; June; fruit small, sour, dark red. New Jersey, west and north; often trailing, not prickly, mostly herbaceous.

76. Silver-weed. Potentilla. (P. anserina.)

LEAF: pinnate, clustered; leaflets, 9–19 (with additional minute pairs), coarsely serrate or lobed, oblong, green above, *silvery-white and silky-hairy beneath*, stipules with cut edge. FLOWER: yellow (petals 5, stamens many), single, on long stems directly from the ground; June–September. New England to Pennsylvania and west; with creeping runners.

77. Clematis. Virgin's-bower. (C. virginiana.)

LEAF: pinnate, opposite; leaflets, 3, 2′–3′ long, coarsely serrate, often somewhat lobed, ovate, apex long-pointed, base a little cordate. FLOWER: white, small (no petals, sepals 4, spreading, stamens many), clustered, abundant; July, August; fruit with feathery appendages; climbs by twisted leaf-stems. (Pl. VII.)

78. Whorled Clematis. (C. verticillaris.)

LEAF: pinnate, opposite (often in pairs); leaflets, 3, 1′–2′ long, entire or slightly serrate or lobed, ovate, base often cordate, apex pointed. FLOWER: purplish, 2′–3′ broad (no corolla, sepals 4, colored, spreading, many stamens), single; May. In rocky and mountainous ground, east; rare; climbing by twisted leaf-stems.

79. Leather-flower. (Clematis viorna.)

LEAF: pinnate (upper occasionally simple), opposite; leaflets, 3–7, entire or 2–3-lobed, ovate-lance-shaped or oblong, base occasionally slightly cordate. FLOWER: purple, large, single (no corolla, sepals 4, 1′ long, *very thick and leathery*, more or less grown together, pointed at apex, many stamens); May–August. Pennsylvania, Ohio, and south; climbing, herbaceous, stalk a little grooved and ridged. (Pl. VII.)

80. Common Cinque-foil. Five-finger. (Potentilla canadensis.)

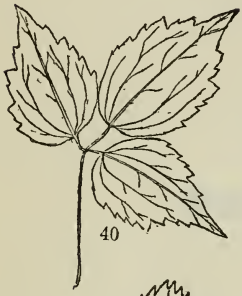
LEAF: palmate; leaflets, 5, 1′–2′, obovate, base wedge-shaped, coarsely serrate toward apex. FLOWER: yellow (petals 5, roundish, stamens numerous), single. April–July; plant silky-hairy, often trailing, herbaceous. (Pl. VII.)

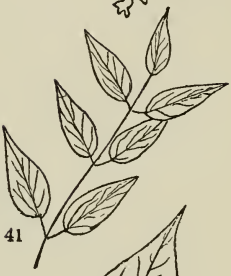
81. Wild Strawberries. (Fragaria vesca, virginiana, and indica.)

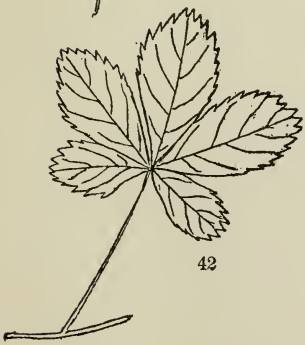
LEAF: trifoliate, clustered, radical, i.e., from the ground; leaflets, 1′–2′ long, obovate, base wedge-shaped, coarsely serrate, stipules growing to base of leaf-stem. FLOWER: white (petals 5, separate, roundish, stamens many), single on stem from ground; in spring; with leafless runners; in 2 species:—*vesca*, with calyx *spreading* or *reflexed* after blossoming, and the small seed-cases *on the surface* of a rounded or conical receptacle; *virginiana*, calyx *erect* after flowering, seed-cases *sunk into pits* on roundish receptacle. Another species (*indica*), introduced, and locally spontaneous near Philadelphia, has the runners leafy, petals yellow, leafy bracts larger than sepals below calyx, fruit tasteless.

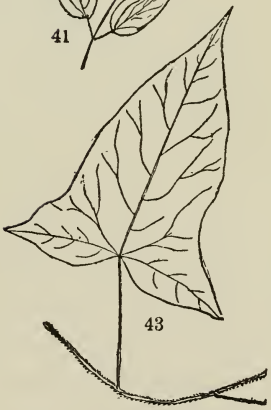
82. Running Buffalo Clover. (Trifolium stoloniferum.)

LEAF: trifoliate; leaflets, broad-obovate or reverse heart-shaped, finely serrate; long running stems. FLOWER: purplish-white, in "heads" (like other clover), but not densely flowered. Ohio, Illinois, and south; trailing, herbaceous.









38. Ground-nut. **73.** (1/3)
39. Climbing Fumatory. **74.**
40. Clematis. **77.** (1/3)
41. Leather-flower. **79.** (1/5)
42. Fine-finger. **80.** (2/3)
43. Halberd-leaved Tearthumb. **84** (2/3)

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83. White Clover. (Trifolium repens.)

LEAF: trifoliate; leaflets, obovate, apex deeply or slightly notched, slightly serrate; leaf- and flower-stems very long. FLOWER: white (corolla much longer than calyx), in small loose "heads"; trailing, herbaceous.

84. Halberd-leaved Tearthumb. (Polygonum arifolium.)

LEAF: 2′–4′, simple, alternate, entire, halberd-shaped; plant-stem 4-angled and grooved, edges covered with reversed fine prickles. FLOWER: white or rosy (no corolla, colored calyx 4–5-lobed, stamens 6), few-clustered; June–September; weak, herbaceous, climbing by prickly stems; in damp ground. (Pl. VII.)

85. Arrow-leaved Tearthumb. (Polygonum sagittatum.)

LEAF: 1′–3′, simple, alternate, entire, arrow-shaped; plant-stem 4-angled, edges covered with reversed fine prickles for climbing. FLOWER: as in 84; in damp ground. (Pl. VIII.)

86. Hop. (Humulus lupulus.)

LEAF: 2′–4′, simple, opposite, serrate, 3–7-lobed, roundish, base cordate, rough above. FLOWER: greenish, small, staminate and pistillate, clustered; June–August; herbaceous, climbing, stems very rough-bristly, with reversed bristles or fine prickles. (Pl. VIII.)

87. Bedstraw. Cleavers. (Galium aparine.)

LEAF: 1′–2′, simple, 6–8-whorled, entire, very narrow, base tapering, apex sharp, midrib and edge rough. FLOWER: white, small (corolla 4-parted, stamens 4), in small clusters; June; fruit prickly; eastward; stem weak, 4-angled, edges covered with fine reversed prickles for climbing. (Pl. VIII.)

88. Rough Bedstraw. Rough Cleavers. (Galium asprellum.)

LEAF: ½′–⅔′, simple, 4–6-whorled, entire, narrow, base and apex tapering, midrib and edge prickly; flower as in 87; fruit small and smooth; northward; stem rough-bristly. (Pl. VIII.)

89. Small Bedstraw. (Galium trifidum.)

LEAF: ¼′–½′, simple, 4–7-whorled, entire, narrow, apex blunt, edge and midrib rough. FLOWER: white, very small (corolla-lobes and stamens 3–4), 1–7-clustered; fruit smooth; in swamps; dries black; stem rough-bristly. (Pl. VIII.)

90. Sweet-scented Bedstraw. (Galium triflorum.)

LEAF: 1′–2′, simple, 4–6-whorled, entire, oval to elliptical, edge rough, apex bristle-pointed. FLOWER: greenish or greenish-white (corolla 4-parted, stamens 4), mostly 3-clustered; fruit covered with hooked prickles; plant sweet-scented when dried; swamps; stem rough-bristly. (Pl. VIII.)

91. Hairy Bedstraw. (Galium pilosum.)

LEAF: 1′ or less, simple, 4-whorled, entire, oval, apex not bristle-pointed, hairy. FLOWER: purplish, brown or whitish; otherwise as in foregoing; July–September; fruit with hooked bristles; stem square, edge roughish or hairy. (Pl. VIII.)

92. Cat-brier. Green-brier. (Smilax rotundifolia.)

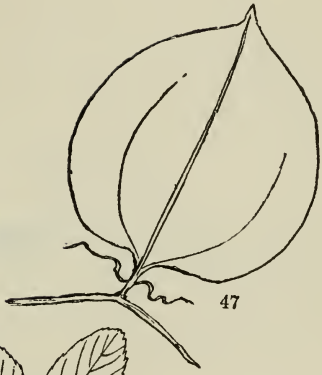
LEAF: 2′–3′, simple, alternate, entire, roundish to ovate, often broader than long, base slightly cordate, apex abruptly pointed, smooth, thickish, rather evergreen southerly, 5–7-veined; tendrils from leaf-stem. FLOWER: greenish or yellowish (no corolla, 6 sepals and stamens), few-clustered, cluster-stem ½′ long or less; May–July; fruit, blue-black berries, with a bloom; stalk and branches often yellow-green; with stout prickles. (Pl. VIII.)

93. False Sarsaparilla. (Smilax glauca.)

LEAF: 2′–4′, much as in 92, but with a whitish bloom beneath, and occasionally above. FLOWER: as in 92, cluster-stem 1′ long or less; fruit, black with a bloom. Massachusetts, south and west; with and without prickles.

94. Stretch-berry. (Smilax bona-nox.)

LEAF: 2′–4′, simple, alternate, entire, roundish heart-shaped, slightly narrowed above broad base, to deeply lobed and fiddle-



44. Arrow-leaved Tearthumb. **85.** (1/2)
45. Hop. **86.** (1/4)
46. Bedstraw Type. **87**, etc.
47. Cat-brier. **92.** (2/3)
48. Rose Type. **99, 100.**

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shaped, edge often bristly; glossy green. FLOWER: as in 92, cluster-stem 1′ or less; fruit, black berries; stalk and branches green. New Jersey, west and south; sparingly prickly.

95. False China-brier. (Smilax pseudo-China.)

LEAF: 3′–5′, simple, alternate, entire, ovate, base cordate or rounded, apex bristle-pointed, often bristly on edge. FLOWER: as in 92, but the stem of cluster 2′–3′ long; July; fruit, black berries. New Jersey, west and south; with few weak prickles or none.

96. Rough Smilax. (S. hispida.)

LEAF: 3′–5′, simple, alternate, entire, ovate (the larger with base cordate), apex bristle-pointed, edge sometimes rough, green both sides. FLOWER: as in 92, but larger, and the cluster-stem 1′–2′ long; June; fruit black. Connecticut, south and west; base of stalk thickly covered with long, blackish, needle-shaped, weak prickles.

97. Walter's Smilax. (S. Walteri.)

LEAF: 3′–4′, simple, alternate, entire, ovate or slightly lance-shaped, base sometimes slightly cordate, apex bristle-pointed, thickish, smooth, green both sides, distinctly 3-veined. FLOWER: brownish, otherwise as in 92; cluster-stem ½′ long or less; April–July; fruit, red berries. New Jersey, and south; few prickles near base; stalk somewhat angled.

98. Matrimony-vine. (Lycium vulgare.)

LEAF: 2′–4′, simple, alternate (or clustered), entire, oval to lance-shaped, or broader toward apex, base tapering. FLOWER: purplish (corolla 5-lobed, spreading, calyx usually 3-lobed, stamens 5), rather small, single or paired; June–August. Cultivated, and spontaneous in Pennsylvania; trailing or drooping, the angled stems often spiny. Southern Europe.

99. Climbing Rose. Prairie Rose. (Rosa setigera.)

LEAF: pinnate, alternate, with stipules; leaflets, 3–5, 1′–2′ long, ovate, serrate, apex pointed. FLOWER: rose-color to

white (petals 5, obovate, many stamens, styles in a column), 2′–3′ across, a little fragrant, clustered; July; fruit spherical, red. New York, west and south; cultivated; climbing, with large prickles. A favorite variety of this almost the only native climber is the Baltimore Belle. (Pl. VIII.)

100. Sweet-brier. Eglantine. (Rose rubiginosa.)

LEAF: pinnate, alternate, with stipules; leaflets, 5–7, ½′–⅔′ long, serrate, oval, downy, with many resinous dots beneath, fragrant when bruised. FLOWER: light rose, fragrant (petals 5, calyx-lobes hairy and deeply cut on edges), mostly single on bristly stems; June–August; fruit oblong or obovate, orange-red. Eastern States; vine and shrub; stalks with both hooked and oval-shaped prickles. A variety has smaller flowers, calyx-lobes not remaining on fruit, and fruit elliptical. (Pl. VIII.)

101. Running Swamp Blackberry. (Rubus hispidus.)

LEAF: pinnate, alternate; leaflets, 3–5, 1′–2′ long, serrate (entire toward the base), obovate, smooth, thickish. FLOWER: white or reddish, small (petals 5, stamens many), few- or many-clustered, cluster-stem often bristly; June; fruit small, sour; trailing, branches somewhat erect (8′–12′); with reversed prickles.

102. Low Blackberry. Dewberry. (Rubus canadensis.)

LEAF: pinnate, alternate; leaflets, 3–7, coarsely serrate, 1′–1½′ long, oval to ovate-lance-shaped, nearly smooth, mostly pointed, thin. FLOWER: white (petals 5, large, stamens many), in leafy-bracted racemes; May; fruit juicy, ½′–1′ in diameter; July, August; shrubby and trailing; somewhat prickly.

103. Club-mosses. (Lycopodium.)

Four species of "evergreen" vines: stems creeping, branches (except in the Carolina) erect, short (3′–8′), stem and branch thickly covered with minute, stiff, awl-shaped, pointed leaves, spreading or appressed to stem. Fruit in catkin-like "spikes," 1′–2′ long, from summit of branches (except in the Carolina). These are the characteristics in common; the special features of the species are as follows:

49. White Passion-flower. **110.** (2/5)
50. Wistaria. **115.** (2/3)
51. Common Club Moss. **103.**
52. Northern Club Moss. **103.**

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NORTHERN CLUB-MOSS; GROUND PINE. (L. complanatum): leaves 4-ranked, of 2 forms, on *flattened, fan-like* spreading branches; lateral leaves somewhat spreading, with projecting sharp points, saw-like; leaves above and below smaller, narrower, *closely appressed* to stem,—the whole appearance somewhat like arborvitæ; "spike" cylindrical (1′ long or more), 2–6 borne on a slender leafless or minutely bracted stalk growing at summit of leafy branch; July; less fan-like far north. (Pl. IX.)

CAROLINA CLUB-MOSS. (L. Carolinianum): stem *and branches* trailing, flattened, leafless on under side, leaves on 3 other sides; the lateral broad-lance-shaped and *widely spreading;* the upper shorter and *closely appressed* to stem; "spike" cylindrical (about 1′), *single* on a minutely bracted slender stalk (2′–4′); July; wet pine-barrens. New Jersey and south.

COMMON CLUB-MOSS. (L. clavatum): leaf of one form, linear awl-shaped, finely bristle-pointed, spreading; branches erect (2′–5′), very leafy; "spike" slender, cylindrical, bristly (1′–2′), 2–3 (rarely 1 or 4) borne on a slender leafless or minutely bracted stalk (4′–6′) that terminates a leafy branch; July; used for Christmas decoration. (Pl. IX.)

INTERRUPTED CLUB-MOSS. (L. annotinum): leaf of one form, lance-shaped, very finely serrate near apex, spreading; spike *single*, thick-cylindrical (1′), borne *direct* from summit of leafy 2–3-forked branch (4′–8′), without intervening leafless stalk; July; in woods of New England; a smaller variety found in White Mountains.

104. Dodder. (Cuscuta.)

Leafless parasitic vines generically called dodder, in 11 species (the last found only on frontier), all with thread-like stems bearing a few minute scales in place of leaves, the whole plant *yellowish* or *reddish*, and supported by the juices of the plants around which they twine; the species are chiefly distinguishable by differences in the minute blossoms ($\frac{1}{8}$′ long or less), as follows:

(N.B.—All but Flax-dodder and Thyme-dodder have stigmas *capitate*.)

GRONOVIUS DODDER. (C. Gronovii): corolla bell-shaped, mostly 5-parted, its tube as long or longer than its *ovate blunt* lobes; flowers with stems, closely or loosely clustered; common throughout, the chief species in the Northeastern States.

FLAX-DODDER. (C. epilinum): stigma *elongated;* flower globular (corolla 5-parted, stamens not exserted), *stemless*, in dense scattered heads; in flax fields, introduced from Europe.

THYME-DODDER. (C. epithymum): stigma *elongated*, stamens *exserted;* introduced; occasionally in clover-beds.

FIELD-DODDER. (C. arvensis): corolla bell-shaped, 5-parted, its tube scarcely longer than the broad-lobed calyx, and shorter than its own lance-shaped lobes; flower on stem in clusters; June, July; earlier and smaller than the others. New York, south and west.

COMPACT DODDER. (C. compacta): corolla with cylindrical tube, sepals 5, *separate*, *roundish*, *slightly toothed*, with 3–5 *bracts* below like sepals; flower stemless, clustered. New York and New Jersey, south, and along southern frontier.

BENDING DODDER. (C. inflexa): corolla fleshy, 4-lobed, its tube as long as the keeled and pointed calyx-lobes; its lobes ovate, *erect* and *finely serrate;* flowers with stems. Southern New England, west.

GREEN-FRUITED DODDER. (C. chlorocarpa): corolla open-bell-shape, mostly 4-parted, lobes often longer than tube, short-stemmed; coarse plant-stem orange-colored. Pennsylvania and Delaware.

SLENDER-FLOWERED DODDER. (C. tenuiflora): corolla 4-parted, its tube *twice the length* of calyx-lobes; lobes of calyx and corolla oblong and blunt; coarse stems yellow. Pennsylvania, west and south, in damp ground.

BEAKED DODDER. (C. rostrata): corolla bell-shaped, 5-parted, its tube *twice* the length of its ovate blunt lobes; flower nearly or quite ¼′ long, larger than in any other of our species. Alleghanies of Maryland and Virginia.

COILED DODDER. (C. glomerata): flowers in very *large*, *close* clusters, each flower with numerous bracts at base, the matted

coils like ropes, often ½′ or more in thickness ; corolla 5-parted, 5 separate sepals. Ohio to Wisconsin, and south.

HANDSOME DODDER. (C. decora): flower broad-bell-shaped, fleshy, corolla 5-lobed, pointed tips of lobes turned in, edge slightly serrate ; calyx-lobes pointed, triangular, "the handsomest of our species." Illinois.

105. Lance-leaved Smilax. (S. lanceolata.)

LEAF : 2′, simple, alternate, entire, short-lance-shaped, thinnish, rather glossy above. FLOWER : greenish or yellowish, small (no corolla, 6 sepals and stamens), clustered ; June ; berries red ; tendrils from some of the leaf-stems. Virginia.

106. Dichondra. (D. repens.)

LEAF : simple, alternate, entire, round-kidney-shaped, fine-hairy, green both sides. FLOWER : white or yellowish, small (corolla bell-shaped, 5-lobed, 2 distinct styles and pods), single ; trailing, herbaceous. Virginia.

107. Cocculus. (C. carolinus.)

LEAF : 2′–3′, simple, alternate, entire or lobed, ovate or cordate, variable, downy beneath. FLOWER : p., greenish (petals and stamens 6), small, clustered ; July, August ; climbing. Virginia and Southern Illinois.

108. Heart-leaved Grape. (Vitis indivisa.)

LEAF : simple, alternate, coarsely serrate, *not lobed*, roundish, base cordate or square, apex sharp, almost entirely smooth. FLOWER : greenish, small (petals and stamens 5), in small loose clusters ; June ; berry size of pea ; tendrils. Virginia and Ohio.

109. Supple-Jack. (Berchemia volubilis.)

LEAF : 2′, simple, alternate, only slightly serrate, long-ovate, apex sharp. FLOWER : p., greenish-white, small petals 5, oblong, pointed, short as calyx-lobes, stamens standing *in front* of petals, not alternating ; June ; high-climbing. Virginia.

110. White Passion-flower. (Passiflora incarnata.)

LEAF: 2′–3′, simple, alternate, serrate, 3-lobed. FLOWER: whitish, with triple purple and flesh-colored crown, 2′ across (petals and stamens 5), single, 3 leafy bracts at base; May–July; fruit oval, large as hen's egg, called *Maypops;* tendrils. Virginia and Kentucky. (Pl. IX.)

111. Melothria. (M. pendula.)

LEAF: simple, alternate, 5-lobed or angled, small, roundish, base cordate, roughish. FLOWER: greenish or yellowish, very small, pistillate and staminate (5 stamens with bell-shaped, 5-lobed corolla), the latter in small racemes, pistillate single; June–August; tendrils. Virginia.

112. Yellow Jessamine. (Gelsemium sempervirens.)

LEAF: 1½′–2′, simple, opposite, entire, ovate to lance-shaped, glossy, with minute stipules. FLOWER: yellow, handsome, nearly 1½′ long, fragrant (corolla funnel-form, 5-lobed, stamens 5, style long), clustered; March, April; twining. Virginia.

113. Fosteronia. (F. difformis.)

LEAF: simple, opposite, entire, short-lance-shaped, thin. FLOWER: pale yellow, small (corolla funnel-form, border 5-lobed, stamens 5), clustered; April; twining. Virginia and Southern Illinois.

114. Smooth Gonolobus. (G. lævis.)

LEAF: 1′–2′, simple, opposite, entire, heart-shaped, smooth. FLOWER: yellowish-green corolla 5-lobed, spreading, with a small crown in centre, stamens 5, 10 pollen masses adhering to stigma, calyx and corolla smooth, clustered on one common stem growing between opposite leaf-stems; July; twining; milky juice. Virginia, and west.

115. Wistaria. (W. frutescens.)

LEAF: pinnate, alternate, with minute stipules; leaflets, 9–13, 1′, ovate-lance-shaped. FLOWER: purple, showy, pea-shaped, in

dense racemes; May; not as fine as the Chinese species, though cultivated; twining. Virginia to Illinois. (Pl. IX.)

116. Clematis. (C. cylindrica.)

LEAF: pinnate, opposite; leaflets, 5–9, long-ovate to lance-shaped, entire or 3–5-lobed. FLOWER: purplish (no corolla, calyx somewhat cylindrical below, lobes *broad*, wide-spreading, with wavy, thin margin), single, large; May–August; climbing by twisted leaf-stems. Virginia.

117. Grape. (Vitis bipinnata.)

LEAF: twice or thrice pinnate, leaflets deeply serrate or lobed. FLOWER: greenish, small (petals and stamens 5), clustered; berry black, obovate; tendrils. Virginia and Kentucky.

118. Rhynchosia. (R. tomentosa.)

LEAF: pinnate; leaflets, three or *one!* roundish, somewhat downy. FLOWER: yellow, somewhat pea-shaped (calyx about as long as corolla, 4-lobed, upper lobe notched), clustered; twining or trailing, herbaceous. Virginia.

119. Bignonia. (B. capreolata.)

LEAF: pinnate, opposite; leaflets, 2, ovate or oblong (often with another small pair close to stalk like stipules), leaf-stem ending in a tendril. FLOWER: orange, 2′ long (corolla rather bell-shaped, 5-lobed, somewhat 2-lipped, 4 stamens), few-clustered; April; pod 6′ long. Virginia.

120. Birthwort. (Aristolochia tomentosa.)

LEAF: 3′–5′, simple, alternate, entire, round-heart-shaped; stalk downy. FLOWER (no corolla, calyx tubular, *curved* like pipe, yellowish, purple at apex, wrinkled border at top): single or paired; June; twining. Southern Illinois.

121. Brunnichia. (B. cirrhosa.)

LEAF: simple, alternate, entire, heart-shaped or ovate, apex pointed; stalk grooved, leaf-stem broader at base. FLOWER: greenish (no corolla, calyx 5-parted, lobes oblong, stamens 8),

2–5-clustered above a bract, these clusters numerous in a raceme ; tendrils. Southwest Illinois.

122. Pitcher's Clematis. (C. Pitcheri.)

LEAF : pinnate, opposite ; leaflets, 3–9, ovate or base cordate, entire or 3-lobed ; highest leaves often simple. FLOWER : purplish (no corolla, calyx bell-shaped, its 4 sepals with narrow recurved points), large, single ; climbing by twisted leaf-stems, mostly herbaceous. Illinois.

123. Few-flowered Kidney-bean. (Phaseolus pauciflorus.)

LEAF : pinnate, alternate ; leaflets, 3, 1′–2′ long, long-ovate to linear. FLOWER : purple, ¼′ long, like pea-blossom, single or few-clustered ; July–September ; pod 1′ or more, straight, narrow ; twining. Illinois.

124. Downy Grape. (Vitis cinerea.)

LEAF : simple, alternate, entire or 3-lobed, downy beneath (and above when young) ; branchlets thickly downy ; fruit black, small, no bloom ; tendrils. Illinois.

125. Red Grape. (Vitis palmata.)

LEAF : simple, alternate, lobed, lobes *tapering*, smooth ; fruit black, shining, no bloom ; tendrils. Illinois.

126. Cupseed. (Calycocarpum Lyoni.)

LEAF : simple, alternate, 3–5-deeply-lobed, large, base cordate, lobes pointed. FLOWER : greenish-white (no petals, sepals 6, stamens 12 or more), in long panicles ; May ; fruit spherical, 1′ diameter, greenish ; high-climbing. Kentucky.

127. Tragia. (T. macrocarpa.)

LEAF : 3′, simple, alternate, serrate, ovate, base *deeply* cordate, mostly *long-stemmed*, stalk hairy. FLOWER : small (no corolla, calyx 3–8-parted, stamens 2–3), in racemes ; twining, herbaceous. Kentucky.

FOREIGN TREES IN CENTRAL PARK

(comprising the principal foreign hardy trees cultivated in the Northeastern United States.)

ANALYTICAL KEY

Not evergreen, nor cone-bearing, nor thorny.

LEAVES SIMPLE:

ALTERNATE:

Entire: 1–4, 10, 51 ("Foreign Shrubs," 11, 50, 52)
Serrate (not lobed): 5–27 ("Native Trees," 23, 59–61, 68)
Lobed (lobes entire, not serrate nor spiny-pointed): 28–31
Lobed (lobes spiny-pointed): 32
Serrate and Lobed: 33, 7, 11, 19, 27 ("Native Trees," 89, 91, 103)

OPPOSITE:

Entire: 34, 35 ("Foreign Shrubs," 5)
Serrate (not lobed): 36
Lobed (not serrate): 35, 37
Serrate and Lobed: 38–41

LEAVES COMPOUND:

PINNATE:

ALTERNATE:

edge of leaflets entire: 42, 43 ("Foreign Shrubs," 56, 57) ("Native Trees," 115)

LEAVES COMPOUND:

PINNATE:

ALTERNATE:

edge of leaflets serrate or lobed: 44–46 ("Native Trees," 115, 118)

OPPOSITE: 46–48

PALMATE: 49 ("Native Trees," 129)

TREES THORNY:

leaves simple: 50, 51, 3 ("Native Trees," 140)

leaves compound (pinnate or trifoliate): 52, 53

EVERGREENS AND CONE-BEARING TREES:

strictly evergreen:

leaves 2–5-clustered, slender, needle-like, 1′–10′ long: 54–58

leaves many in a whorl, short, slender, stiff: 59, 60

leaves not clustered nor whorled, each growing from a separate point, very short (¼′–2′), except in 62

slender, but flat: 61–66, 73

awl-shaped, not flat, usually stiff: 67–70 ("Native Trees," 162)

leaves 4-whorled, ¼′, prickly: 71, 72

leaves extremely small (1/16′–¼′), scarcely recognizable as leaves, flat and roundish, or slender and often prickly, the branches with the closely appressed (when not prickly) leaves forming more or less *flat sprays*: 74–76

Trees not evergreen, but deciduous; cone-bearing; leaf ½′–1′ or more, needle-like, pliant, whorled: 77, 78

ANALYTICAL KEY

(Of foreign trees in Park with ornamental blossoms.)

blossoming before leaves appear: 1, 2 ("Foreign Shrubs," 2, 5)

blossoming with or after leaves:

leaves simple, alternate, entire: 3 ("Foreign Shrubs," 11, 50, 52)

leaves simple, alternate, serrate: 12–20, 32

leaves pinnate or trifoliate: 42, 43, 45, 52, 53 ("Foreign Shrubs," 56, 57)

leaves palmate: 49

DESCRIPTION OF FOREIGN TREES IN CENTRAL PARK

1. Yulan. (Magnolia conspicua.)

LEAF: 6′–8′, simple, alternate, entire, obovate, apex pointed, downy when young. FLOWER: white, very large, fragrant (petals 6–9, sepals 3), single, very profuse, *before leaves;* low tree. China. (Pl. I.)

2. Chinese Judas-tree. (Cercis japonica.)

LEAF: 2′–3′, simple, alternate, entire, somewhat roundish, base only slightly cordate, apex somewhat pointed, smooth, 5-veined. FLOWER: rich reddish-purple, pea-shaped covering tree *before* leaves, larger than in American species; low tree and shrub.

3. Oleaster. (Elæagnus angustifolia.)

LEAF: 2′–3′, simple, alternate, entire, elliptical, both ends pointed, *both sides silvery*, as also young shoots. FLOWER: yellow, fragrant (calyx bell-shaped, 4–8-lobed, stamens as many as lobes, 1 style), 1–3-clustered, lateral; midsummer; often thorny; low tree and shrub; from the Orient. (Pl. I.)

4. Small-leaved Willow. (Salix rosmarinifolia.)

LEAF: 2′–4′, simple, alternate, entire, elliptical, above smooth, beneath silky-shiny; blossoms in May. Sweden.

5. European Alder. (Alnus glutinosa.)

LEAF: 2′–3′, simple, alternate, serrate, roundish to obovate, apex blunt or emarginate, base wedge-shaped, bright green beneath, hairy in angles of veins, sticky when young (as also branchlets); long yellowish catkins in March; bark blackish; *native* alders are shrubs. ("Native Shrubs," Pl. IX.)

6. European Alder. (Alnus cordata.)

LEAF: 2′–3′, simple, alternate, serrate, ovate, base cordate, apex considerably pointed; young branches mostly hairy, but not sticky; catkins in April. Italy.

7. Paper Mulberry. (Broussonettia papyrifera.)

LEAF: 4′–6′, simple, alternate, serrate, often lobed, ovate, *very* rough-hairy above, thick soft-downy beneath, base sometimes cordate. Japan. (Pl. III.)

8. European Hornbeam. (Carpinus betulus.)

LEAF and bark as in American species ("Native Trees," 35); most evident difference in the fruit-bract, which has a very long, serrate middle lobe in the European, but a much shorter one with entire edge in the American.

9. European Chestnut. (Castanea sativa.)

LEAF: as in American species ("Native Trees," 41), but *blunt* at base, not pointed; flower in catkins; nut larger and less sweet.

10. European Beech. (Fagus sylvatica.)

LEAF: 2′–3′, simple, alternate, entire or wavy-toothed, more hairy, smaller and rounder than the American beech. Var. *purpurea* (copper or bronzed beech) has very dark foliage; var. *pendula* has long pendent branches; var. *asplenifolia*, cut-leaved beech, has longer leaves deeply cut. (Pl. I.)

11. Black Mulberry. (Morus nigra.)

LEAF: 3′–5′, simple, alternate, serrate, often 2–3-lobed, ovate to roundish; fruit ovate, violet-black. Europe.

12. Asiatic Cherry. (Prunus cerasus.)

LEAF: simple, alternate, serrate, elliptical, not hairy, stiffly divergent from stem. FLOWER: white (5 petals, many stamens, 1 style), in lateral umbels; early May.

13. Japanese Plum. (Prunus pissardii.)

LEAF: 1′–2′, simple, alternate, serrate, oval to ovate, small, *purplish*. FLOWER: white (petals 5, many stamens), in umbels; spring; low tree or shrub.

14. Grape-cherry. (Prunus padus.)

LEAF: 1′–3′, simple, alternate, serrate, oval to elliptical, smooth, slightly wrinkled; leaf-buds long, pointed. FLOWER: white (petals 5, many stamens), in abundant, showy racemes, about first of May; fruit cherry-shaped, black; ornamental tree in bloom. Europe, Asia.

15. European Cherry. (Prunus Mahaleb.)

LEAF: 1′–2′, simple, alternate, serrate, ovate, base sometimes cordate, of agreeable odor, not hairy, often 2 glands on stem. FLOWER: p. white (details as in native cherry) in stemmed corymbs; May; 12°–20°.

16. Apple-tree. (Pirus malus.)

LEAF: 1′–3′, simple, alternate, serrate, oval, woolly beneath. FLOWER: white to rosy (petals, sepals and styles, 5, many stamens), in lateral umbels; May.

17. Japanese Flowering Apple. (Pirus floribunda.)

LEAF: 2′, simple, alternate, serrate, obovate, small. FLOWER: *rose-red*, abundant (of apple-type), in early spring; fruit small; very low tree or shrub, very ornamental.

18. Chinese Crab-apple. (Pirus spectabilis.)

LEAF: 2′, simple, alternate, serrate, oblong-lance-shaped, smooth. FLOWER: red or rose-color, *semi-double*, in umbels (of apple-type); April and May; fruit reddish-green; 20°–30°.

19. Toringo Apple-tree. (Pirus Toringo.)

LEAF: 2′, simple, alternate, serrate (on new shoots often 3–5-lobed), oval to oblong, hairy beneath. FLOWER: white (petals, sepals and styles 5, latter woolly at base, stamens many), in small clusters; May; fruit small, globular, yellow, astringent; low tree or shrub. Japan.

1. Yulan. **1.** (1/5)
2. Oleaster. **3.** (1/2)
3. European Beech. **10.** (1/2)
4. Cut-leaved Beech. ("Native Trees," **91.**) (1/2)
5. Southern Over-cup Oak. **28.** (1/3)
6. Turkey Oak. **29.** (1/2)
7. English Oak. **30.** (1/4)

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20. European Linden. (Tilia europæa.)

LEAF: 3′–4′, as in American species ("Native Trees," 20), but not so cordate and oblique at base. FLOWER: as in American species, but with *no petal-like scale* in front of petal as in our own species.

21. English Elm. (Ulmus campestris.)

LEAF: 2′–4′, simple, alternate, serrate, oval to obovate, pointed, mostly smooth; fruit *deeply* notched at apex; branches *horizontal* or *upward slanting*.

22. Scotch or Wych Elm. (Ulmus montana.)

LEAF: 2′–5′, simple, alternate, serrate, roughish, buds not downy; calyx, lobes and stamens about 5; fruit 1′ long, smooth.

23. Small-leaved Elm. (Ulmus parvifolia.)

LEAF: less than 1′, simple, alternate, serrate, elliptical, almost leathery; blossoms in May and June with leaves; fruit ovate, not hairy, apex notched; bark loosening in thick layers. China.

24. Long-stemmed Mountain Elm. (Ulmus effusa.)

LEAF: 2′–4′, simple, alternate, serrate, elliptical, base tapering, very one-sided, pointed, smooth above, long-stemmed; blossoms early, before leaves; fruit hairy-edged.

25. Willow. (Salix pentandra.)

LEAF: 3′–4′, simple, alternate, serrate, ovate-elliptical, short-pointed, bright green beneath, many glands on stem; like laurel leaf; flowers in May. Europe.

26. Lance-leaved Willow. (Salix lancifolia.)

LEAF: 3′–4′, simple, alternate, finely but sharply serrate, oblong-lance-shaped, hairy both sides when mature; flowers before leaves. Germany.

27. Purple-leaved Birch. (Betula alba, var. atropurpurea.)

Essentially like our white birch ("Native Trees," 65), but with purple foliage.

28. Southern Over-cup Oak. (Quercus lyrata.)

LEAF: 5′–8′, simple, alternate, 7–9-lobed (lobes triangular, acute, not serrate), obovate-oblong, glossy above, whitish beneath, crowded at end of branch; nut globular, almost enclosed in rough globular cup. Southern and Western States. (Pl. I.)

29. Turkey Oak. (Quercus cerris.)

LEAF: 4′–5′, simple, alternate, pinnately lobed, not serrate, long-oblong, broadest in middle, dark green above, hairy when young, short-stemmed; acorn-cup with long divergent scales. Southern Europe. (Pl. I.)

30. English Oak. (Quercus robur.)

LEAF: 4′–6′, simple, alternate, lobed (not as deeply as in our white oak, which it resembles, but not as large, nor whitish beneath), no teeth or bristles. Var. *pendula* with drooping branches. Var. *asplenifolia* with cut-leaved foliage. (Pl. I.)

31. Ginkgo. (Salisburia adiantifolia.)

LEAF: 2′, on long stem, simple, alternate, fan-shaped, fern-like, deeply notched at apex, lobes again lobed or wavy-edged, base wedge-shaped; flowering minute as in yew; tree of peculiar figure, with few large branches. Japan. (Pl. III.)

32. European Holly. (Ilex aquifolium.)

Much like American species ("Native Trees," 49); evergreen, leathery, more glossy, and berries brighter red; flowers about the same; tree and shrub. Var. *macrophyllum*, with large leaves.

33. Oriental Plane. Sycamore. (Platanus orientalis.)

LEAF: 3′–5′, as in our buttonwood ("Native Trees." 88), but more cut and becoming smooth, and fruit-heads larger.

8. Paulownia imperaiis. **34.** (1/5)
9. Field Maple. **37.** (1/4)
10. Japanese Maple. **38.** (1/3)
11. Cut-leaved Japanese Maple. **38.** (1/2)
12. Norway Maple. **39.** (1/4)
13. Sycamore Maple. **40.** (1/4)

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34. Paulownia imperialis.

LEAF: 6′–12′, simple, opposite, entire, roundish, pointed, base cordate; much as in catalpa, but more downy. FLOWER: violet, nearly 2′ long (corolla funnel-shaped, lobed), in large, erect panicles; June; bark smooth, dark. Japan. (Pl. II.)

35. Japanese Catalpa. (C. bungei.)

LEAF: 6′–10′, simple, opposite, entire, often 3-lobed or angled, roundish, pointed, smooth. FLOWER: half the size of native species; low tree and shrub.

36. Cercidophyllum japonicum.

LEAF: 1½′–2′, simple, opposite, minutely serrate, round, apex slightly pointed, paler beneath; flower inconspicuous; low tree. Japan.

37. Field Maple. (Acer campestre.)

LEAF: 3′–4′, simple, opposite, 3–5-lobed (lobes blunt, entire or lobed, not serrate), rather roundish, some hairy beneath, as also stem, both sides same color. FLOWER: greenish, in corymbs; May; fruit with divergent wings, broadest at ends; tree and shrub. Europe. (Pl. II.)

38. Japanese Maple. (Acer polymorphum, with var.)

LEAF: 2′–3′, simple, opposite, serrate, about 5-*palmately*-lobed, rather small. Flowers in corymbs; May; fruit with short, blunt, divergent wings. Var. *palmatum* is 7–9-lobed, and in var. *dissectum atropurpureum* the lobes are finely cut, almost feathery, of rich rose-color, later purple; very handsome. (Pl. II.)

39. Norway Maple. (Acer platanoides.)

LEAF: 5′–7′, simple, opposite, 5-lobed, with large but *very sharply* pointed teeth, deep green, large. FLOWER: yellowish-green in profuse clusters, latter part of April; fruit with large, very divergent wings; *juice milky*. Europe. (Pl. II.)

40. Sycamore Maple. (Acer pseudo-platanus.)

LEAF: 5′–6′, simple, opposite, rather closely and evenly serrate, 3–5-lobed, large, on long reddish stems. FLOWER: greenish, in large pendent panicles; May. Europe. Var. *folius atro-purpureus* has leaf deeply colored on both sides. (Pl. II.)

41. Tartarian Maple. (Acer tartaricum.)

LEAF: 4′–5′, simple, opposite, lobed, cut and serrate, base slightly cordate, both sides colored alike. FLOWER: whitish, small, in short, erect panicles, late in May, after the leaves; fruit-wings at last red.

42. Common Laburnum. (Laburnum vulgare.)

LEAF: pinnate, alternate; leaflets, 3, 2′–3′ long, entire, oblong, slender-stemmed. FLOWER: yellow, showy, pea-shaped, rather large, in long racemes, late spring; low tree or shrub. Europe.

43. Sophora Japonica.

LEAF: pinnate, alternate; leaflets, 11–13, entire, small, oval or tapering, smooth. FLOWER: cream-white, small, pea-shaped, in loose panicles, late summer; low to medium-sized. Japan. (Pl. III.)

44. English Walnut. (Juglans regia.)

LEAF: pinnate, alternate; leaflets, 5–9, 4′–5′, obscurely serrate, oval, smooth. FLOWER: in catkins, or 1-to-few-clustered; husk of fruit friable, nut roundish, thin-shelled. Asia.

45. Kœlreuteria. (K. paniculata.)

LEAF: pinnate, alternate; leaflets, 9–13, irregularly serrate and lobed. FLOWER: yellow, small (petals 3 or 4, each with a 2-parted small scale, sepals 5, style 1), in large panicles, late summer; small tree. China. (Pl. III.)

46. Cork-tree. (Phellodendron amurense.)

LEAF: pinnate, alternate below, opposite above; leaflets, 11–17, serrate, lance-shaped. FLOWER: staminate and pistiliate

(calyx 5-parted in latter, 5 distinct sepals in former, petals 5 or 10); June; corky bark. Amur.

47. Flowering Ash. (Fraxinus ornus.)

LEAF: pinnate, opposite; leaflets, 5–9, serrate, entire at base, small, oblong to lance-shaped, downy beneath. FLOWER: small (petals 4 or 2, greenish), along branch, with or before leaves. Southern Europe.

48. European or English Ash. (Fraxinus excelsior.)

LEAF: pinnate, opposite; leaflets, 5–9, serrate, lance-oblong, bright green, almost stemless. FLOWER: no petals, hardly calyx. Var. weeping ash (in Park) has pendent branches. Southern Europe.

49. Red Horse-chestnut. (Pavia rubra.)

LEAF: palmate, opposite; leaflets, 5–7, bright green. FLOWER: rose-red (petals 4, stamens usually 8), in dense panicles, early summer; fruit prickly; probably a hybrid; low tree and shrub. Asia.

50. Osage Orange. (Maclura aurantica.)

LEAF: 3′–5′, simple, alternate, entire, lance-ovate; fruit crowded in spherical head, size of orange; bark rough, yellow-tinged; usually spiny. Arkansas, etc. (Pl. III.)

51. Common Sandthorn. (Hippophæ rhamnoides.)

LEAF: 1′–2′, simple, alternate, entire, long-elliptical, green above, silvery beneath. FLOWER: yellowish or greenish, the staminate with 2 small, ovate sepals, 4 stamens; pistillate with lobed, tubular calyx; fruit orange-color; 10°–20°; often thorny. Europe.

52. Chinese Honey-locust. (Gleditschia sinensis.)

LEAF: pinnate or twice-pinnate; leaflets small, entire, *oval*, *broader* than in native species. FLOWERS same as, thorns stouter than, in our species.

53. Orange. (Citrus trifoliata.)

LEAF: trifoliate, alternate; leaflets, 2′, blunt-elliptical, stemless; the leaf-stalk winged. FLOWER: creamy-white (petals 4–8, linear-oblong, thick, stamens usually many, their filaments somewhat united); May; fruit orange-yellow, small; low tree or shrub, spiny. Japan. (Pl. III.)

54. Spanish Pine. (Pinus mugho.)

LEAF: 2′, in twos, needle-like, sharp-pointed; *cone*, 2′, oval, horizontal, often 2–3-clustered, scales prickly at apex; tree and shrub.

55. Scotch Pine. (Pinus sylvestris.)

LEAF: 2′–4′, in twos, rather flat, bluish-white; cone tapering, the scales with tubercle-like tips; *bark reddish* on upper part of trunk; prevalent in Northern Europe.

56. Austrian Pine. (Pinus austriaca.)

LEAF: 4′–6′, in twos, rigid, slender, dark green; cone conical, 3′ or less; large tree, with rough bark.

57. Himalayan White Pine. (Pinus excelsus.)

LEAF: 6′–8′, in fives, whitish, slender, in large *pendent* tufts, nearly twice as long as in native white pine; cones large, 6′–10′ long.

58. Swiss, Stone, or Cembra Pine. (Pinus cembra.)

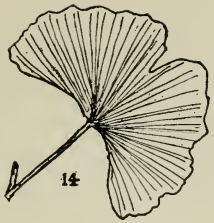
LEAF: 3′–4′, in fives, 4-angled, green, crowded, on erect branches; cone somewhat roundish, 2′ long, *erect*, with round seeds the size of peas; small tree from the higher Alps.

59. Cedar of Lebanon. (Cedrus Libani.)

LEAF: 1′, much as in larch (whorled), but stiff, evergreen, and dark; cone large, globular; branches stiff and horizontal. (Pl. IV.)

60. Himalayan Cedar. (Cedrus atlantica.)

LEAF: less than 1′, short and clustered as in larch, stiff, evergreen, the outer ones always smaller; flat-3-angled, bluish green; cone 4′ or more.



14. Ginkgo. **31.** (1/3)
15. Sophora japonica. **43.** (1/4)
16. Mulberry. **7.** (1/4)
17. Kœlreuteria. **45.** (1/5)
18. Osage Orange. **50.** (1/3)
19. Orange. **53.** (1/4)

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61. Silver Fir of Colorado. (Abies concolor.)

LEAF: 2′, flat, blunt-pointed, somewhat 2-ranked, bluish above, whitish beneath; rare.

62. Cephalotaxus. (C. fortunei.)

LEAF: 3′ or more, flat, gradually sharp-pointed, rather long, 2-ranked; fruit elliptical, a little over 1′ long. China.

63. European Yew. (Taxus baccata.)

LEAF: 1′, flat, green both sides, rather 2-ranked; pistillate flower developing into a small, red, berry-like fruit with blackish seed; a tall tree in Europe, but only a low tree or shrubby in this country, of which our "ground hemlock" is a variety. (Pl. IV.)

64. Asiatic Silver Fir. (Abies Nordmanniana.)

LEAF: 1′, flat, blunt, curved, rather broad, and quite thick set on branch, green above, whitish beneath; cone, ovate, large.

65. Douglas Spruce. (Tsuga Douglasii.)

LEAF: 1′ or more, flat, minutely stemmed, light green, somewhat 2-ranked; cone 2′–3′, its serrate and pointed bracts projecting beyond scales. Rocky Mountains and west.

66. Japanese Yew. (Taxus cuspidata.)

LEAF: 1′, flat, linear, apex rounded then suddenly sharp, thickened on edge, 2-ranked; low tree.

67. Norway Spruce. (Abies excelsa.)

LEAF: ¾″, needle-shaped, single, rigid, pointed, growing from all sides of branch; cone 5′–7′, rather slender, its scales thin; generally recognized by *pendent branchlets* (especially in old trees) and long cones. Europe; becoming naturalized.

68. Eastern Spruce. (Abies orientalis.)

LEAF: ½″, short, needle-shaped, thick, 4-angled, blunt, not 2-ranked; cone, a little over 2′; tree much like "Norway," but smaller in all details; branches fine-hairy. Asia; rare.

69. Colorado Blue Spruce. (Abies pungens.)

LEAF: ¾′, needle-shaped, stiff, pointed, not 2-ranked; foliage rich blue or sage color; rare.

70. Cryptomeria. (C. japonica.)

LEAF: ½′ or less, awl-shaped, very tapering, incurved, rather appressed, crowded on branch; cone globular, peculiarly rough, the scales large at summit, surmounted by reflexed bristly points or teeth. (Pl. IV.)

71. Juniper. (Juniperus sabina.)

LEAF: ¼′, slender, stiff, sharp-pointed, 4-whorled; a prostrate shrub with upright branches; fruit small, blue-black, berry-like. Middle Europe.

72. Juniper. (Juniperus squamata.)

Much like the last, but leaves less divergent from branch, and a more prostrate shrub.

73. Heath-leaved Cypress. (Retinospora ericoides.)

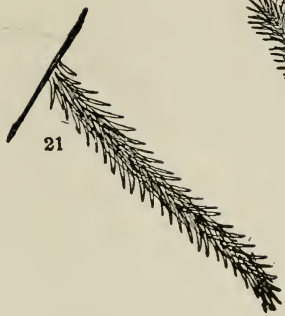
LEAF: ¼′, awl-shaped, small, *not rigid*, divergent from branch, crowded; cone globular, size of pea; foliage has a *fluffy* effect. Japan. (Pl. IV.)

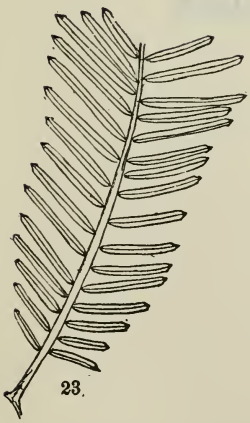
74. Cypress. Retinospora. (R. obtusa.)

LEAF: ¼′ or less, small, much as in arborvitæ, above and below *very* small and ovate, the lateral quite large, blunt, keeled; foliage with *white bloom* beneath; the berry-like cone size of pea, with 8 or 10 scales, 2 seeds under each. Var. *aurea* has young foliage with yellow or white variegation. Japan. (Pl. IV.)

75. Cypress. Retinospora. (R. pisifera.)

LEAF: ¼′ or less, small, much as in arborvitæ, but all of about same size, those above and below ovate-pointed, the lateral keeled; cone-berries like peas. Japan. (Pl. IV.)





20. Cedar of Lebanon. **59.** (1/3)
21. Cryptomeria. **70.** (1/2)
22. Hearth-leaved Cypress. **73.** (1/2)
23. European Yew. **63.** (1/2)
24. Retinospora. **75.** (1/2)
25. Pyrus aria. Page 128. (1/3)

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76. Giant Arborvitæ. (Thuja gigantea.)

LEAF: as in common arborvitæ ("Native Trees," 166), but *all* pointed and flat; tree 90°–150°. Northwestern America.

77. European Larch. (Larix europæa, with var. pendulata.)

LEAF: about 1′, in dense whorled clusters, also singly along branch, soft, needle-like, *deciduous;* cone about 1′ long, much larger than in American species; the variety *pendulata* has long drooping branchlets. ("Native Trees," Pl. XV.)

78. False Larch. (Pseudo-Larix Kæmpheri.)

LEAF: as in preceding, but longer and broader, not so many in a cluster, with blue-white lines beneath, golden-yellow in fall; cone 2′–3′, oblong-ovate, hanging. China.

FOREIGN SHRUBS IN CENTRAL PARK

(Comprising the principal foreign hardy shrubs cultivated in the Northeastern United States.)

ANALYTICAL KEY

Shrubs *not* "evergreen" (like spruce or pine) nor cone-bearing.

Shrubs whose blossoms are *not* in the form of catkins, as in chestnut.

Shrubs *not* thorny nor prickly:

blossoms *before* or *with* the leaves:

flowers white: 1–3, 36(a, c), 63(b, c), 71 ("Native Shrubs," 102)

flowers purplish or rosy to red: 2–4, 36(b, c), 43, 47, 63(b, c), 71 ("Native Shrubs," 102) ("Foreign Trees," 2)

flowers yellow: 5–10, 54

blossoms *after* the leaves:

GROUP I.—Blossoms White or Cream-white

Section I.—Flowers Polypetalous

LEAVES SIMPLE:

Alternate:

Entire: 11–14, 71

Serrate (not lobed): 14–18, 19 (a, d, e, j, k), 73 ("Foreign Trees," 13, 19)

LEAVES SIMPLE:—*Continued.*

ALTERNATE:

Serrate and lobed: 19 (e, k), 46

Lobed (lobes ending in spines): ("Foreign Trees," 32)

OPPOSITE:

Entire: 20

Serrate or lobed: 21–25, 64 ("Native Shrubs," 27)

LEAVES COMPOUND:

PINNATE: 26–28, 19 (f, g)

PALMATE: 29

SECTION II.—FLOWERS (WHITE) MONOPETALOUS

LEAVES SIMPLE:

ALTERNATE:

Serrate: 30, 31

OPPOSITE (or whorled):

Entire: 32–35, 36(a, c), 63(b–d) ("Native Shrubs," 60, 61, 112) ("Foreign Trees," 35)

Serrate (not lobed): 37–39, 48 (c, g), 24, 64

Serrate and lobed: 40, 41

Lobed (not serrate): ("Foreign Trees," 35)

GROUP II.—BLOSSOMS ROSE-TINTED TO RED, OR FLESH-COLORED

LEAVES SIMPLE:

ALTERNATE:

Entire: 42–45, 4, 12, 14

Serrate: 46, 14, 18, 19(a–c, h, i) ("Native Shrubs," 104) ("Foreign Trees," 17)

LEAVES SIMPLE:—*Continued.*

OPPOSITE (or whorled):

Entire: 47, 36 (b, c), 63 (b, c) ("Native Shrubs," 112)

Serrate or lobed: 48, 64

LEAVES PALMATE: ("Foreign Trees," 49)

GROUP III.—BLOSSOMS YELLOW (OR YELLOWISH)

LEAVES SIMPLE:

ALTERNATE:

Entire: 49–52 ("Native Shrubs," 120) ("Foreign Trees," 3, 51)

Serrate or lobed: 53, 54

OPPOSITE:

Entire: 55

LEAVES PINNATE: 56–59 ("Foreign Trees," 42)

GROUP IV.—BLOSSOMS BLUE, PURPLE (OR PURPLISH) OR DARK

LEAVES SIMPLE:

ALTERNATE:

Entire: 60–62, 72

OPPOSITE:

Entire: 63 (a, d) ("Native Shrubs," 61) ("Foreign Trees," 34, 35)

Serrate: 64, 65

GROUP V.—BLOSSOMS GREENISH, OR GREENISH-WHITE, INCONSPICUOUS

LEAVES SIMPLE:

ALTERNATE: 66

OPPOSITE: 67, 68 ("Foreign Trees," 36, 38)

Foreign Shrubs in Central Park

SHRUBS THORNY:

LEAVES SIMPLE: 69–73, 12 ("Native Shrubs," 125, 157) ("Foreign Trees," 3, 50, 51)

LEAVES PINNATE: 74–77

LEAVES PALMATE: 78–80

SHRUBS WITH FLOWERS in catkins or heads not ornamental: 81

SHRUBS EVERGREEN (like spruce or pine): see Analytical Key of foreign evergreen trees.

DESCRIPTION OF FOREIGN SHRUBS

1. Star-flowered Magnolia. (Magnolia stellata.)

LEAF: 2′–4′, simple, alternate, entire, elliptical, thick, leathery. FLOWER: p. white, 3′ across (petals about 15, narrow, stamens many), single, before leaves, said to be the earliest flowering and smallest magnolia; 4°–8°. Japan. (Pl. I.)

2. Purple Magnolia. (M. purpurea and soulangeana.)

LEAF: 5′–7′, simple, alternate, entire, oval to obovate, *thick*, deep green. FLOWER: p. purplish-pink and white, large, 3′ long or more, single (petals 6 or 9, stamens many), abundant, showy, before leaves. Purpurea is more purple than soulangeana, which is probably a hybrid. 5°–15°. Japan.

2ª. Chinese Dwarf Cherry-tree. (Prunus sinensis.)

LEAF: 1′–3′, simple, alternate, serrate, elliptical, hairy beneath on veins, no glands on stem. FLOWER: p. white or rosy-red (petals 5, stamens many), abundant, 2–3-clustered, earliest spring; only about 3° high.

3. Flowering Almond. (Amygdalon communis flore pleno.)

LEAF: 2′, simple, alternate, serrate, oblong-lance-shaped, smooth, 1 or 2 glands on stem. FLOWER: double, rose-color or white, before the leaves. Asia.

4. African Tamarix. (Tamarix africana.)

LEAF: ⅛′, simple, alternate, awl-shaped, minute, appressed to stem; branches very slender, somewhat drooping. FLOWER: pink, very small (petals and sepals 4 or 5, stamens 8 or 10), profuse, *entirely covering* branches of last year's growth; delicate and unique; May and June. (Pl. I.)

1. Star-flowered Magnolia. **1.** (1/4)
2. Tamarix. **4.** (1/4)
3. Early-flowering Jessamine. **10.** (3/4)
4. Oak-leaved Hydrangea. **25.** (2/5)
5. Bladder-nut. **27.** (1/3)
6. European Snowball. **40.** (1/2)

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5. Cornelian Cherry. (Cornus mas.)

LEAF: 2′–3′, simple, opposite, entire, ovate or long-ovate, pointed. FLOWER: yellow, small (4 petals and stamens, single style), clustered, profuse, before leaves; often in full bloom April 1st in Park; fruit oblong, cherry-red; tall shrub or low tree. Europe.

6. Forsythia. Golden Bell. (F. viridissima.)

LEAF: 3′–5′, simple, opposite, serrate, lance-shaped, deep green. FLOWER: m. golden-yellow, showy (corolla bell-shaped), deeply 4-lobed, lobes spreading, 2 stamens, profuse in small clusters along last year's growth, March and April, before leaves; branches spreading but not drooping. China. (Pl. IV.)

7. Forsythia. (F. suspensa.)

LEAF: 2′, simple, opposite, serrate, ovate, smaller, duller, and thinner than in last; branches slender, long and drooping. FLOWER: as in last, but earlier and less profuse, before leaves. China. (Pl. II.)

8. Forsythia. (F. Fortunei.)

LEAF: 2′, simple, opposite, entire or obscurely serrate, oblong, lance-shaped, dull green above, glossy beneath. FLOWER: essentially as in last; March, April. China.

9. Azalea. (A. pontica.)

LEAF: 2′–4′, simple, alternate, entire, obovate or oblong, apex mucronate, thin, not evergreen. FLOWER: m. orange-yellow, slightly fragrant, 2′ across or more (corolla tubular-bell-shaped, 5-lobed, tube sticky, 5 *long* stamens, 1 long style), in terminal clusters; before leaves in spring. Native of the Caucasus.

10. Early-flowering Jessamine. (Jasminum nudiflorum.)

LEAF: pinnate, opposite; leaflets, 3 or 5, ½′–¾′, entire, oblong, pointed. FLOWER: m. yellow (corolla salver-shaped, 6-lobed, 2 stamens, 1 style), single; March, before leaves; drooping shrub, or trained as a vine. China. (Pl. I.)

11. Cotoneaster. (C. frigida.)

LEAF: 2′–3′, simple, alternate, entire, oblong, pointed, brown-woolly beneath. FLOWER: p. white (sepals and spreading petals 5, stamens many, styles 2), clustered, numerous; May; fruit reddish-black, then black; 15°–20°. Himalaya.

12. Common Quince. (Cydonia vulgaris.)

LEAF: 2′, simple, alternate, entire, al to ovate, cottony beneath. FLOWER: p. white or pale rosy (petals 5, stamens many, calyx-lobes leafy, styles 2–5), single at ends of stems; late spring; often thorny. From the Levant.

13. Exochorda. (E. grandiflora.)

LEAF: 2′–3′, simple, alternate, entire, oblong or base tapering, smooth. FLOWER: p. white (5 roundish calyx-lobes, petals 5, stamens 15, short style), in lateral clusters; May. China.

14. Buckthorn. (Rhamnus frangula.)

LEAF: 2′–3′, simple, alternate, entire or minutely serrate, el liptical, pointed; bark white-dotted. FLOWER: p. white or pinkish, small (petals and stamens 4–5, latter standing on a fleshy disk, 1 style), clustered; May, June; 6°–15°. Orient; thornless.

15. Deutzia. (D. crenata.)

LEAF: 2′–4′, simple, alternate, finely round-toothed, ovate to long-ovate, dull green. FLOWER: p. white (petals 5, stamens 10, alternate ones longer, filaments broader upward, 2-lobed at top), in abundant small panicles; May, June. Japan.

16. Deutzia. (D. gracilis.)

LEAF: 2′–3′, simple, alternate, sharply serrate, lance-ovate, bright green, smooth. FLOWER: p. very white, small, details as in last, but stamen-filaments *forked* at top; May. Japan.

17. Deutzia. (D. scabra.)

LEAF: 2′–4′, as in *crenata*, but wrinkled, quite rough, and minutely sharp-serrate. FLOWER: as in *crenata*, but stamen-filaments *tapering* and *not* lobed at top. Japan.

18. Californian Rose-mallow. (Hibiscus californicus.)

LEAF: 3′–5′, simple, alternate, serrate, *not lobed*, ovate, cordate at base, soft-hairy and ashy gray beneath. FLOWER: p. white or rose, with purple eye, 3′–5′ across (petals 5, stamens in a column, 5 capitate stigmas on united styles).

19. The Spiræas. (Spiræa.)

The leaf is usually simple, alternate, serrate, 1′–2′, rarely compound or lobed. The flower is polypetalous, with 5 petals and many stamens, small and clustered, usually white, sometimes pink or red. The specific details are as follows:

(a) *S. callosa:* leaf coarsely and finely sharply serrate, lance-oblong, apex tapering. Flower (with 10 glands in calyx) in dense terminal clusters. Var. *alba* has white, var. *rosea* has deep pink blossoms. Japan.

(b) *S. Antonia wateri:* leaf coarsely serrate, long oval, apex pointed. Blossoms in large heads of bright crimson or deep pink; only 2°–3° high; compact and dwarf. Japan.

(c) *S. Douglasii:* leaf serrate, lance-oblong, apex blunt, a little whitened beneath. Flowers small, deep pink, in erect panicles of spike-like clusters; much like "hard hack," but deeper colored. California and Oregon.

(d) *S. prunifolia:* leaf finely and sharply serrate, ovate, small. Flower as cultivated *full-double*, white, ⅓′ across, profuse. Japan.

(e) *S. Reevesii:* leaf coarsely serrate, often 3–5-lobed, elliptical, blue-green beneath; branches not hairy. Flower white, in compact clusters; May, June. Var. *flore pleno* has flowers double; 3°–5°. Japan.

(f) *S. sorbifolia:* leaf pinnate, alternate; leaflets 17–21, sharply serrate, lance-shaped, quite tapering. Flower white, small, in large terminal panicles. Siberia. (Pl. II.)

(g) *S. Van Houtii:* leaf pinnate, alternate; leaflets 3, serrate, oval. Flowers white, profuse; May; 4°–6°. Japan. (Pl. II.)

(h) *S. salicifolia:* leaf serrate, elliptical, smaller at base, smooth. Flower flesh-red in terminal panicles; June–August; branches angular; 3°–6°. Siberia.

(i) *S. Fortunei:* leaf serrate, oblong-lance-shaped. Flower rose-colored, in flat-topped clusters ; June.

(j) *S. Thunbergii:* leaf sharply serrate, oblong-lance-shaped, not hairy ; branches hairy. Flowers white, 2–5-clustered ; April ; 3°. Japan.

(k) *S. trilobata:* leaf serrate, slightly 3-lobed, roundish, not hairy. Flowers white, clustered, profuse ; May ; 2°. Siberia. (Pl. II.)

20. European Red-osier. (Cornus sanguinea.)

LEAF : 2′–3′, simple, opposite, entire, ovate, somewhat downy beneath ; branches becoming bright red at end of winter. FLOWER : p. white, small (petals and stamens 4), in flat-topped clusters, early in summer ; berries small, black or purplish.

21. Philadelphus. (Syringa.) (P. gordonianus.)

LEAF : 3′–4′, simple, opposite, serrate, ovate, pointed, hairy both sides, branches drooping. FLOWER : p. white (petals 4, toothed at apex, many stamens, 4 or 5 styles more or less grown together), single ; July ; 6°–9°. Northwestern America. Var. *aurea nana* is smaller, with yellow foliage.

22. Rhodotypus. (R. kerrioides.)

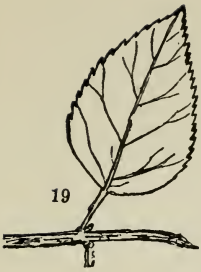
LEAF : 3′, simple, opposite, irregularly and sharply serrate, ovate-lance-shaped, bright green, not hairy, of vivid color late in fall. FLOWER : p. white, nearly 2′ across (petals 4, roundish, stamens many, *sepals large*), single, terminal ; April and all summer ; somewhat resembles a rose. Japan.

23. Hydrangea. (H. nivea.)

LEAF : 2′–4′, simple, opposite, serrate, ovate or slightly cordate, pointed, *white-woolly* beneath, green and smooth above. FLOWER : p. white (calyx 4–5-toothed, small petals as many as calyx-teeth, stamens 8–10), in flat cymes, a few marginal flowers sterile and *enlarged.* Southern States.

24. Hydrangea. (H. paniculata grandiflora.)

LEAF : 3′–5′, simple, opposite, serrate, long-ovate, pointed, slightly hairy. FLOWER : white, afterward rosy, *sterile* (con-



19. Forsythia suspensa. **7.** (2/3)
20. Spiræa sorbifolia. **19.** f.
21. Spiræa Van Houtii. **19.** g.
22. Three-lobed Spiræa. **19.** k.
23. Rosa rugosa. **76.** c.

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sisting of enlarged 4–5-lobed calyx), in immense terminal clusters; August, September; 3°–6°. Japan.

25. Oak-leaved Hydrangea. (H. quercifolia.)

LEAF: 4′–5′, simple, opposite, serrate and 5-lobed, oval, large. FLOWER: as in 23, but in oblong panicles, and with many enlarged sterile flowers; 5°–6°. Southern States. (Pl. I.)

26. Bladder-nut. (Staphylea colchica.)

LEAF: pinnate, opposite; leaflets, 5 or 3, 2′–3′, serrate, long-ovate, long-pointed, smooth; stipules longer than leaf-stem. FLOWER: p. white (petals oblong-lance-shaped, 5, stamens 5, hairy at base, long style), in abundant clusters; May; pod over 2′ long. Southeastern Europe.

27. Bladder-nut. (Staphylea pinnata.)

LEAF: pinnate, opposite; leaflets, 5–7, 2′–3′, serrate, oblong-lance-shaped, smooth; stipules, length of leaf-stem. FLOWER: as in last, but stamens *not hairy;* inflated pod 1′ in diameter. (Pl. I.)

28. Xanthocera. (X. sorbifolia.)

LEAF: pinnate; leaflets, 6–10, 2′–3′, sharply serrate, lance-shaped. FLOWER: p. white (petals 5, stamens 8, staminate and pistillate), clustered; May. China.

29. Dwarf Horse-chestnut. (Æsculus macrostachya.)

LEAF: palmate, opposite; leaflets, 5–7, 3′–6′, serrate, long-obovate, apex pointed, base tapering. FLOWER: p. white (petals 4, erect, narrow, stamens 6–8, filaments very long), in erect spikes 1° long; July, August; fruit smooth; 5°–9°. Southern States.

30. Stuartia. (S. pentagyna.)

LEAF: 2′–5′, simple, alternate, serrate, oval. FLOWER: m. cream-white (petals 5 or more, more or less united at base, crimped on edge, sepals often reddish outside, stamens many, united at base, orange-colored anthers, 5 styles), large, showy, 3′–4′ across; July, August; 8°–12°. Mountains south of Virginia. A native shrub on edge of territory.

31. Storax. (Styrax japonica.)

LEAF: 2½′, simple, alternate, serrate, ovate or long-ovate, pointed. FLOWER: m. white (corolla deeply 5–8-lobed, hairy, stamens 10–16, style 1), clustered; June, July; 4°–6°.

32. Fontanesia. (F. Fortunei.)

LEAF: 1′–3′, simple, opposite, entire, elliptical, smooth. FLOWER: m. white, small (corolla 4-lobed, 2 stamens, 1 style, 2-lobed at apex), in terminal and lateral clusters; July; 8°–12°; often arboreal. Syria.

33. California Privet. (Ligustrum ovalifolium.)

LEAF: 2′, simple, opposite, entire, oval, dark green above; whole bush *entirely smooth*. FLOWER: m. white (corolla salver-shaped, 4-lobed, 1 style 2-lobed at apex), clustered; summer. Japan.

34. Ibota Privet. (Ligustrum Ibota.)

LEAF: 2′, simple, opposite, entire, elliptical; a *hairy* shrub. FLOWER: essentially as in last. Japan.

35. Italian Privet. (Ligustrum Italicum.)

LEAF: 1′–1½′, simple, opposite, entire, elliptical, both ends pointed. FLOWER: m. white (details as in foregoing); berries white in fall. Europe.

36. Honeysuckles. (Lonicera.)

LEAF: 2′–3′, simple, opposite, entire, oval to elliptical, mostly smooth, and almost or quite stemless. FLOWER: m. white to pinkish (corolla tubular-bell-shaped, 5-lobed, somewhat irregular, or 2-lipped, 5 stamens, slender style), few-clustered; specific details as follows:

(a) *L. fragrantissima:* leaf 1½′–3′, hairy on midrib beneath, as also young shoots. Flower rather hairy inside, whitish, very fragrant, *early* spring; bark shreddy; berries entirely or almost separate; 3°–6°. China.

(b) *L. rubra:* a variety of *fragrantissima* with red flowers.

(c) *L. tartarica:* leaf 2′–3′, oval, base cordate. Flower whitish or pinkish, paired, along branch; spring and early summer; berries red, joined at base; 5°–8°. Siberia.

(d) *L. Morrowi:* leaf (2′–3′) and white flower much as in the foregoing, but of straggling habit in its form.

37. Japanese Viburnum. (V. tomentosum.)

LEAF: 3′–5′, simple, opposite, coarsely serrate, ovate, hairy above. FLOWER: m. white, small (corolla 5-lobed, spreading, stamens 5, stigma 3-lobed, no style), in compound clusters, with a *few larger sterile* ones in border; May. Japan; low shrub.

38. Japanese Viburnum. (V. plicatum.)

LEAF: 3′–5′, simple, opposite, serrate, ovate or long-ovate, pointed, slightly plaited. FLOWER: m. white, in very abundant "heads," *all* flowers sterile, handsome; May. Japan.

39. European Viburnum. (V. lantana.)

LEAF: 2′–3′, simple, opposite, serrate, elliptical, pointed, loose-hairy above, woolly-whitish beneath. FLOWER: as in last, but fragrant, and with none enlarged and sterile; clustered; May.

40. European Snowball. (Viburnum opulus.)

LEAF: 2′–3′, simple, opposite, serrate and 3-lobed, fine-hairy and green beneath, glandular-bristly on stem. FLOWER: m. white (details as in 37), in large clusters in which a few middle blossoms are small and regular, and the outer ones much larger, with no stamens nor pistils; May; berries bright red, elliptical; high, often arboreal. (Pl. I.)

41. American Snowball. (Viburnum oxycoccus.)

Like the last, but smaller; flower-clusters smaller, fruit larger; a cultivated form.

42. Azalea. (A. amoena.)

LEAF: ½′–1′, simple, alternate, rather crowded at end of branch, entire, oblong or elliptical, thick, leathery, glossy, small. FLOWER: m. rose-red (corolla funnel-shaped, 5 spreading lobes,

5 stamens), clustered; May; 2°–3°; brilliant in full bloom. China. (Pl. III.)

43. Cotoneaster. (C. vulgaris.)

LEAF: 2′–3′, simple, alternate, entire, ovate, yellow-downy beneath, smooth above. FLOWER: p. almost flesh-colored (5 erect petals, many stamens, 2 styles), 1- to few-clustered, abundant; April; fruit reddish, rarely white or yellow; 1°–6°. Europe.

44. Tamarix. (T. germanica.)

LEAF: ⅛′, simple, alternate, entire, linear-lance-shaped, blunt, very small. FLOWER: p. red (sepals 5, petals 8, stamens 10), small, in terminal spikes; summer. Europe.

45. Late-flowering Tamarix. (T. Indica.)

Much like last, but blossoms *in fall* (August, September) on same year's growth. Europe, Africa.

46. Rose of Sharon. Shrubby Althæa. (Hibiscus syriacus.)

LEAF: 2′–3′, simple, alternate, coarsely serrate, 3-lobed (middle one usually tapering), rather ovate, base wedge-shaped. FLOWER: p. rose-color, purplish or white, 3′ across (petals 5 or many, many stamens joined in tube-form, their bases adhering to base of petals), single along branch; September; arboreal shrub. Syria.

47. Erica. (E. carnea.)

LEAF: ½′, simple, 3- or 4-whorled, linear, small, smooth, edge slightly rolled under. FLOWER: m. flesh-red, small (corolla tubular, contracted at apex, 4-toothed, stamens 8, style 1); April, May. Alps, Ireland.

48. Weigelas. (Weigela.)

LEAF: 2′–3′, simple, opposite, serrate, ovate-lance-shaped. FLOWER: m. tubular with lobed border, 5 stamens, 1 style; specific details as follows:

(a) *W. rosea*: flower rose-red, corolla 1′ long or more; May, June; 3°–7°; a variety has variegated foliage.

(b) *W. Desboissii:* like last, but flowers much deeper rose.

(c) *W. candida:* like *rosea*, but flowers cream-white.

(d) *W. Abel Carriere:* like *rosea*, but flowers bright rose.

(e) *W. Eva Ratke:* like *rosea*, but flowers a clear, brilliant crimson.

(f) *W. Lavallei:* hybrid; like *rosea*, but flowers dark reddish purple; straggling.

(g) *W. amabilis:* leaf wrinkled, rather large. Flower red or white, broadening suddenly from base, 3-clustered.

49. Chinese Azalea. (A. mollis.)

LEAF: 2′–3′, simple, alternate, entire, elliptical, hairy (as also branches). FLOWER: m. yellow (corolla broad-bell-shaped, 5-lobed, stamens 5), clustered; May; 2°–3°.

50. Silver-leaved Oleaster. (Elæagnus argentea.)

LEAF: 1′–2′, simple, alternate, entire, oval, silvery on both sides. FLOWER: yellowish, fragrant, perianth bell-shaped, lobes spreading, stamens and pistil in each, mostly; stamens as many as perianth-lobes; June–August; fruit red; young branches beset with brown scales; 6°–18°. Western States; sometimes a tree.

51. Buffalo-berry. (Shepherdia argentea.)

Like the last, but leaf oblong, narrowed at base; flowers mostly staminate and pistillate, stamens twice as many as lobes.

52. Smoke-tree. (Rhus cotinus.)

LEAF: 1½′–3′, simple, alternate, entire, broad-oval to roundish, smooth, thickish, quite long-stemmed. FLOWER: p. yellowish, small (petals and stamens 5), in panicles, abundant; June; 4°–10°. Europe. The lengthened flower-stems are later much branched and hairy, giving a cloudy effect, whence the name; shrub or low tree. (Pl. III.)

53. Kerria. Corchorus. (K. japonica.)

LEAF: 2′–3′, simple, alternate, serrate, lance-ovate, thin. FLOWER: p. yellow, handsome (petals 5, many stamens), in

single and full-double varieties, the latter somewhat like small full roses; May; *branches bright green from March on;* another form has foliage white-variegated; 2°–5°. (Pl. III.)

54. Buffalo or Missouri Currant. (Ribes aureum.)

LEAF: 2′, simple, alternate, 3-lobed and coarse-toothed, roundish. FLOWER: p. bright yellow, spicy-fragrant (petals and stamens 5, styles 2 or 1), in small racemes bearing leafy bracts; early spring; berries blackish, tasteless. Western States. (Pl. III.)

55. St. John's-wort. (Hypericum moserianum.)

LEAF: 1′ or more, simple, opposite, entire, with translucent dots. FLOWER: p. yellow, *large*, 2′ or more across (petals 5, many stamens), abundant, low shrub.

56. Siberian Pea-tree. (Caragana arborescens.)

LEAF: even-pinnate; leaflets, 8–16, 1′ long, entire, elliptical, somewhat hairy, *prickly-pointed.* FLOWER: yellow, pea-shaped, in umbels; May; 6°–12°. Siberia; slightly arboreal. (Pl. III.)

57. Bladder-senna. (Colutea arborescens.)

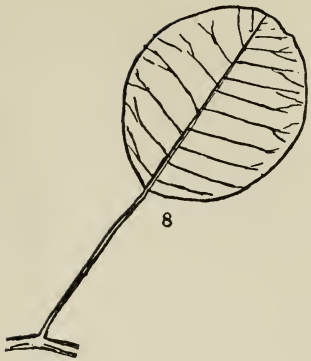
LEAF: odd-pinnate; leaflets, about 11, 1′, entire, oval, emarginate, dull green. FLOWER: yellow, pea-shaped, 3–6-clustered, throughout summer; of arboreal figure. Europe. (Pl. III.)

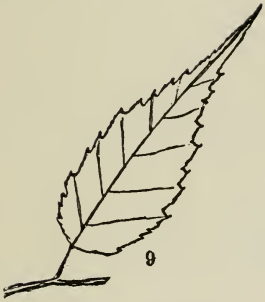
58. Holly-leaved Barberry. (Mahonia aquifolium.)

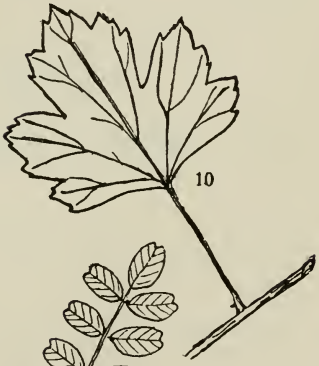
LEAF: pinnate, alternate; leaflets, 5–9, 2′, spiny-toothed, oval or long-ovate, *very glossy.* FLOWER: p. yellow (petals 6, 1 stamen *in front* of each petal, their anthers with hinged valves at top like trap-door, 1 pistil), in racemes; spring, berries black or blue with bloom; 2°. Oregon. (Pl. IV.)

59. European Elder. (Sambucus nigra.)

LEAF: odd-pinnate; leaflets, mostly 5, 1′–3′, serrate, long-ovate, long-pointed. FLOWER: m. yellowish-white, fragrant (corolla







7. Azalea amœna. **42.** (1/2)
8. Smoke-tree **52.** (1/2)
9. Kerria japonica. **53.** (2/3)
10. Missouri Currant. **54.** (2/3)
11. Siberian Pea-tree. **56.** (1/2)
12. Bladder-senna. **57.** (1/3)

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wheel-shaped, 5-lobed, stamens 5, 3–5 stigmas without styles) in compound clusters; June; fruit black. Var. *aurea* has yellow-variegated foliage.

60. Lycium. (L. chinensis.)

LEAF: 1½′–2½′, simple, alternate, entire, oval, base tapering; branches drooping, seldom thorny, whole plant smooth. FLOWER: blue-violet (corolla short-funnel-shaped with 5 spreading lobes, 5 stamens projecting from corolla-tube, bearded at base). China. (Pl. IV.)

61. Rhododendron. (R. ponticum.)

LEAF: 4′–6′, simple, alternate, entire, obovate-lance-shaped, base tapering, evergreen, thick, smooth. FLOWER: m. purple, very open-bell-shaped (corolla 5-lobed, stamens 10, style 1), in terminal clusters, late spring; low shrub. Pontus, etc.

62. Rhododendron. (R. hybridum.)

Leaf essentially as in last; flower variable in color by grafting foreign upon native stock.

63. Syringa. Lilac. (Syringa.)

In all lilacs the leaf (3′–4′) is simple, opposite, entire; flower is m. tubular, with 4-lobed and more or less spreading border, in large clusters; details as follows:

(a) *S. Josikæa:* leaf elliptical, base tapering, glossy, lighter beneath, somewhat fleshy, not hairy. Flower deep violet-blue, odorless, lobes not spreading; June; 8°–12°. Hungary.

(b) *S. Persica:* leaf lance-ovate. Flower white, corolla-lobes *wide*-spreading or flat when fully open, rather loosely clustered; 2 varieties, *alba* and *rubra* (reddish flowers), in Park.

(c) *S. vulgaris alba:* leaf ovate, base somewhat cordate. Flower fragrant, lobes *somewhat* spreading, in crowded compound panicles; spring; color white and red in varieties *alba* and *rubra*. Eastern Europe.

(d) *S. villosa:* flower light purple in bud, then white; two weeks later than other lilacs.

64. Hydrangea. (H. hortensis.)

LEAF: 3′–5′, simple, opposite, serrate, oval, *bright green.* FLOWER: blue, purple, pink or white, almost all neutral and enlarged, in large, dense, roundish clusters; half-hardy. China.

65. Aucuba. (A. japonica.)

LEAF: 2′–3′, simple, opposite, somewhat serrate, oblong-ovate, large, bright green, commonly yellow-marbled. FLOWER: p. dull purple, minute, staminate and pistillate (petals and stamens 4, style short, stigma capitate), in small panicles; handsome red berries. Japan.

66. Japanese Oleaster. (Elæagnus longipes.)

LEAF: 1′–2′, simple, alternate, serrate, thick, dark green above, silvery-white beneath. FLOWER: greenish-white, inconspicuous, perianth bell-shaped, 4–8-lobed. Fruit large, bright red in July; 3°–5°.

67. Tree Box. (Buxus sempervirens.)

LEAF: 1′, simple, opposite, entire, evergreen, thick. FLOWER: greenish (no corolla, 4 sepals, 4 stamens or 3 styles) in small lateral clusters; erect, compact shrub with single trunk; from the Mediterranean.

68. Japanese Spindle-tree. (Euonymus japonica.,

LEAF: 2′–3′, simple, opposite, finely serrate, obovate, glossy. FLOWER: p. greenish-white (obovate petals and stamens 4, latter borne on flat disk, slender style), in small clusters; globular pods bright colored; branchlets 4-angled.

69. Chinese Barberry. (Berberis Thunbergii.)

LEAF: ½′, simple, alternate, entire or sparingly serrate, obovate or with tapering base. FLOWER: p. yellow (sepals, petals and stamens 6, latter with lid at top of anther !), clustered; May; stems brownish red, usually thorny at base of leaves.

70. Evergreen Thorn. (Cotoneaster pyracantha.)

LEAF: 2′–3′, simple, alternate, round-toothed, ovate-lance-shaped, glossy, evergreen, not hairy; young shoots yellow-hairy. FLOWER: p. white (petals and styles 5, stamens many), panicled; May; fruit like peas, scarlet; 4°–6°; thorny. Europe.

71. Japanese Quince. (Pirus japonica.)

LEAF: 2′, simple, alternate, entire, oval to oblong, with wedge-shaped base, a little glossy. FLOWER: p. rosy, scarlet, to white (petals 5 or more), rather large, handsome, before or with the leaves; first of May; somewhat thorny.

72. Lycium. (L. barbarum.)

LEAF: 1½′–2½′, simple, alternate, entire, oblong-lance-shaped, base tapering; branches drooping, fine-hairy, often thorny. FLOWER: m. purplish-white, rather salver-shaped or funnel-form (corolla 5 lobed, 5 stamens, bearded at base); summer Northwestern Africa.

73. Evergreen Buckthorn. (Rhamnus alaternus.)

LEAF: 2′–3′, simple, alternate, serrate, oblong to elliptical, dark, glossy, leathery, evergreen. FLOWER: p. white, small (petals and stamens 4–5, latter standing on a disk), in lateral clusters; often thorny.

74. Chinese Aralia. (A. chinensis.)

LEAF: twice or thrice pinnate, opposite; leaflets, 5–7, oval, pointed, serrate; stem fine-hairy. FLOWER: p. whitish (petals and stamens 5, styles 5 or 2), small, in large compound clusters; August, September; 6°–9°; thorny. (Pl. IV.)

75. Barberry. (Berberis Fortunei.)

LEAF: pinnate; leaflets, 7–9, small, lance-elliptical, dark green above. FLOWER: much as in 69, but crowded, short-stemmed; June; thorny. North China.

76. Roses. (Rosa.)

LEAF: pinnate, alternate; leaflets, 5–7 (1′–2′), serrate. FLOWER: of the rose type, p. petals 5 or many, stamens many; stems thorny (except in Boursaltii); specific details as follows:

(a) *R. canina:* leaflets, 5–7, elliptical, not hairy; prickles stout, sickle-shaped. Flower rosy, sepals feathery; June; fruit oblong, dark red; 3°–9°. Europe.

(b) *R. centifolia:* leaflets, 5, oval, hairy beneath. Flower rose-color, large, full double (calyx-lobes mostly somewhat pinnate), single, on long stems; June; stems erect, with stout curved thorns.

(c) *R. rugosa:* leaflets, 7, oval, pointed, dark vivid green, thickish, somewhat wrinkled. Flower rose-red, petals 5. Var. with white flowers; June. (Pl. II.)

(d) *R. Boursaltii:* leaflets, 7, oval, base tapering, thin. Flower deep pink, petals 5; shrub and vine; *thornless.*

77. European Raspberry. (Rubus idæus.)

LEAF: pinnate (7 leaflets) or trifoliate; leaflets serrate, more or less white-cottony beneath, ovate, pointed. FLOWER: p. white (petals 5, about or quite as small as sepals, stamens many), in small clusters; May, June; thorny.

78. European Raspberry. (Rubus fruticosa.)

LEAF: palmate; leaflets, 5, serrate. FLOWER: p. reddish (details as in last, but petals not as small), in loose, terminal clusters; June, July; fruit black; thorny.

79. Cut-leaved Raspberry. (Rubus laciniata.)

LEAF: palmate; leaflets, 5, fringe-cut, hairy beneath. FLOWER: p. violet (details as in last), in large, terminal clusters; July, August; thorny. (Pl. IV.) (The illustration should have been palmate.)

80. Japanese Aralia. (A. pentaphylla.)

LEAF: palmate, opposite; leaflets, 5, serrate, elliptical, pointed, pale green. FLOWER: as in 74; thorny. (Pl. IV.)

13. Holly-leaved Barberry. **58.** (1/3)
14. Lycium. **60.** (3/4)
15. Cut-leaved Raspberry. **79.** (1/2)
16. Aralia pentaphylla. **80.** (1/2)
17. Chinese Aralia. **74.** (1/2)
18. Forsythia viridissima. **6.** (3/4)

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81. European Hazel-nut. (Corylus avellana, with var. atropurpurea.)

Leaf · 3′–4′, simple, alternate, serrate, slightly roundish, base cordate, downy when young. Flower : staminate in slender dense catkins ; fertile in a small "head"; oval nut, 1′ long, enclosed in deeply lobed involucre of about same length ; young shoots bristly. Var. *atropurpurea* has dark purple foliage which becomes almost green by fall.

FOREIGN VINES IN CENTRAL PARK

(Comprising the principal foreign hardy vines cultivated in the Northeastern United States.)

ANALYTICAL KEY

THORNLESS:

LEAVES SIMPLE:

Vines climbing by small rootlets terminating in sucker-like disks: 1–3, 5 ("Native Vines," 3)

Vines climbing by tendrils: 7

Vines climbing by twining branches or leaf-stems: 8–10, 16 ("Native Vines," 42, 58)

Vines trailing: 11, 12 ("Native Vines," 54, 98)

LEAVES PINNATE OR TRIFOLIATE:

Alternate: 1, 6, 13, 24

Opposite: 4, 14–19 ("Foreign Shrubs," 10)

LEAVES PALMATE: 20

THORNY: 21–24 ("Native Vines," 98)

DESCRIPTION OF FOREIGN VINES

1. Ampelopsis. "Boston Ivy." (A. veitchii.)

LEAF: simple or pinnate, alternate; leaflets, 3 or 5, 1′–4′, coarse-serrate, glossy, ovate-long-pointed or elliptical, smooth; sometimes, especially in young plants only simple, ivy-lobed. FLOWER: inconspicuous (petals 4–5, soon falling, stamens 4–5), clustered; a delicate climber; deciduous; climbing by rootlets with sucker-like disks; var. *tricolor* has variegated foliage. (Pl. I.)

2. Irish or Scotch Ivy. (Hedera hibernica.)

LEAF: 2′–3′, simple, alternate, 3–5-lobed (sometimes entire), evergreen, glossy. FLOWER: p. greenish-yellow (petals, stamens and styles 5 or 10), clustered; berries black; not essentially different from common ivy, of which it is perhaps only a variety; climbing by rootlets. (Pl. I.)

3. Schizophragma hydrangeoides.

LEAF: 2′–4′, simple, opposite, serrate, ovate-cordate to roundish, long-pointed, glossy, long-stemmed. FLOWER: p. white or flesh-colored (petals 5), in terminal cymes 6′ across, fall; vigorous, climbing by rootlets. Japan. (Pl. I.)

4. Great-flowered Trumpet-flower. (Tecoma grandiflora.)

LEAF: pinnate, opposite; leaflets, 5–11, 2′–3′, serrate, lance-shaped, narrower than in native species *radicans*. FLOWER: scarlet and orange-yellow, 3′ broad and long (corolla wide-bell-shaped, 5-lobed); climbing less than *radicans*, by rootlets. Japan.

5. Spindle-tree. (Euonymus radicans.)

LEAF: 1½′, simple, opposite, serrate, roundish or oval, rather leathery, evergreen. FLOWER: greenish, small (petals and sta-

mens 4–5, latter on a disk, 1 style, 3–5-lobed stigma), clustered; climbing by rootlets with sucker-like disks; a variety has variegated foliage.

6. Everlasting Pea. (Lathyrus latifolia.)

LEAF: pinnate, alternate; leaflets, 2, oval, entire, the leaf-stalk ending in a tendril; leaf- and plant-stems wing-margined, the latter broadly (and not hairy). FLOWER: pink-purple (with a white variety), odorless, pea-shaped, in racemes; climbing by tendrils. Europe. (Pl. I.)

7. European Grape. (Vitis vinifera.)

LEAF: 3′–4′, simple, alternate, serrate, 3–5-lobed, cordate at base, rounded, woolly beneath when young. FLOWER: greenish, somewhat fragrant (petals and stamens 5), in large clusters; late in spring; tendril-bearing.

8. Honeysuckle. (Lonicera Halleana.)

LEAF: 2′–3′, simple, opposite, entire, almost evergreen. FLOWER: m. pure white, turning yellow (corolla tubular, with 5 lobes), flowering from July more or less till late fall; a scarcely distinguishable variety of the next; twining.

9. Honeysuckle. (Lonicera japonica.)

LEAF: 2′–3′, simple, opposite, entire, oval or long-ovate, short-stemmed, stem downy. FLOWER: m. white, later yellow, often reddish or purplish outside (corolla, as in last, in pairs); berries blackish; twining.

10. Honeysuckle. (Lonicera brachypoda.)

LEAF: 2′–3′, simple, opposite, entire, ovate-oblong, apex pointed, smooth, on short stem. FLOWER: m. yellow (corolla as in last), in small lateral clusters, almost stemless; very fragrant; twining. Japan.

11. Common Periwinkle. (Vinca minor.)

LEAF: 2′, simple, opposite, entire, lance-elliptical, glossy, evergreen. FLOWER: m. bright blue, rarely white (corolla

salver-shaped, 5-lobed, 5 stamens, 1 style), single; spring and early summer; stems creeping, blossoming branchlets upright; suitable for shady spots under trees. Europe.

12. Prostrate Juniper. (Juniperus squamata.)

LEAF: ¼′, sharp, rigid, in threes; see under Foreign Trees.

13. Chinese Wistaria. (W. sinensis.)

LEAF: pinnate, alternate; leaflets, 9–15, 2′–3′, entire, lance-ovate. FLOWER: purplish-blue, pea-shaped (only 1 appendage at base of "wing" petals, instead of 2, as in native species), in dense racemes longer than in native, and the vine higher-climbing; often twice-flowering in season; twining.

14. Sweet-scented Clematis. (C. paniculata.)

LEAF: pinnate (simply or doubly), opposite; leaflets, 3 to 5 or more, entire or lobed, ovate to long-ovate, long-stemmed. FLOWER: white, small, fragrant (no corolla, usually 4 white sepals, many stamens and pistils), in panicles, profuse; mid-summer; fruit with feathery appendage. Europe; climbing by twisted leaf-stalks. (Pl. I.)

15. Sweet-scented Clematis. (C. flammula.)

Much like last, but leaflets commonly lobed, and flowers less profuse. Europe.

16. Clematis. (C. Jackmannii.)

LEAF: trifoliate or simple; leaflets entire, lance-ovate, hairy beneath, as also stem. FLOWER: violet-purple, *very large*, *single*, with 6 outspread sepals, widest in middle; summer; climbing by twisted leaf-stalks. Japan.

17. Clematis. (C. lanuginosa.)

Like last, but blossoms bright blue.

18. Clematis. (C. Henryi.)

Like last, but blossoms creamy-white and still larger.

19. Clematis. (C. coccinea.)

Leaf much as in foregoing, but smaller, more delicate, and rather roundish; irregular; flower *scarlet*, somewhat tubular, slightly spreading at apex, not profuse; inferior to all the others.

20. Akebia. (A. quinata.)

LEAF: palmate; leaflets, 5, 1′–1½′, oval to roundish, entire, notched at apex, rather long-stemmed. FLOWER: violet, pistillate and staminate (3 concave sepals), in small lateral clusters; April, May. Japan. (Pl. I.)

21. Field Rose. (Rosa arvensis.)

LEAF: pinnate; leaflets, 5–7, serrate, oval, stem hairy and often prickly. FLOWER: white, seldom red, single or clustered; June, July; low, creeping or climbing; with curved thorns.

22. Crimson Rambler.

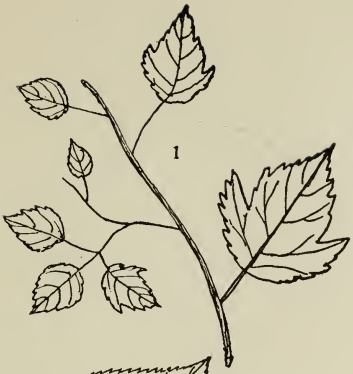
LEAF: pinnate; leaflets, 5–7, serrate, oval, glossy. FLOWER: crimson, small, semi-double, in very profuse clusters; May, June. Japan; thorny.

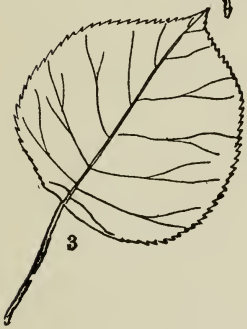
23. Yellow Rambler.

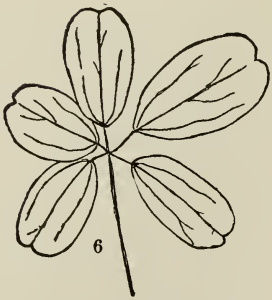
Much like last, but blossoms yellow in bud, yellow-tinged when half-opened, white when fully grown, 2′–2½′ across, 6–10-clustered, slightly fragrant; thorny.

24. Memorial Rose. (R. Wichuriana.)

LEAF: pinnate, alternate; leaflets, 5–7, *small*, oval, serrate. FLOWER: pure white, profuse, 1½′–2′ across, yellow stamens, blooming throughout July; low and trailing; good for rockeries, etc., a Japanese variety.







1. Ampelopsis veitchii. **1.** (1/3)
2. Scotch Ivy. **2.** (1/3)
3. Schizophragma. **3.** (1/2)
4. Everlasting Pea. **6.** (2/5)
5. Clematis paniculata. **14.** (1/3)
6. Akebia quinata. **20.** (2/3)

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PLANT-STRUCTURE

LEAF : leaves are SIMPLE and COMPOUND :

SIMPLE, when in one piece ; Fig. 1.

COMPOUND, when in parts so distinct that each part looks like a small but complete leaf ; the subdivisions are called LEAFLETS ; in a twice-compound leaf each leaflet is similarly subdivided ; Fig. 2.

COMPOUND LEAVES are of two sorts : PINNATE and PALMATE.

PINNATE has the leaflets along the stem, and at right angles with it ; even- and odd-pinnate differ in regard to the end-leaflet ; Fig. 2.

PALMATE has all the leaflets radiating from the apex of the leaf-stem ; Fig. 3.

ARRANGEMENT OF LEAVES ON BRANCH. Fig. 4

Leaves are arranged in four ways :

ALTERNATE, when following along singly on branch (a).

OPPOSITE, when in pairs, on opposite sides of branch (b).

WHORLED, when three or more circle around stem at same point (c).

INDETERMINATE, when closely and irregularly crowded on stem (d).

Most leaves have longer or shorter stems, but some are stemless or *sessile.*

FORMS OF SIMPLE LEAVES

THE GENERAL FORM of a leaf (Fig. 5) may be roundish (a), oval (b), oblong (c), ovate (d), obovate (e), elliptical (f), arrow-shaped (g), halberd-shaped (h), lance-shaped (i), linear (j), or requiring some combination of these terms.

THE BASE (Fig. 6) may be square (a), rounded (b), tapering (c), wedge-shaped (d), pointed (e), or cordate (more or less heart-shaped) (f).

THE APEX may be blunt, sharp, taper-pointed, or notched (emarginate) (Fig. 7).

THE EDGE (Fig. 8) may be *entire* (a), wavy (b), or variously cut; when the incisions are small, it is *serrate* or *toothed* (c); when large, lobed (d); with long, sharp projections it is *bristle-pointed* (e); there is great variety in size and form of teeth and lobes; many leaves are both serrate and lobed. All the variations in form and edge of simple leaves may occur in the leaflets of a compound leaf.

BLOSSOM

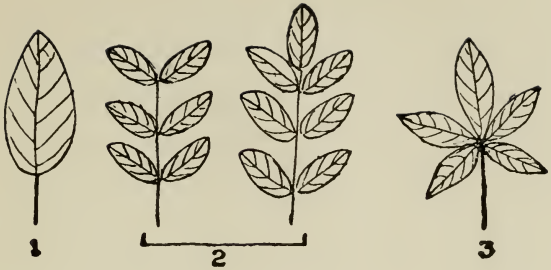
A complete blossom has four distinctive parts: viz., calyx, corolla, stamens and pistil (Fig. 9).

CALYX: this is an outer whorl, usually resembling minute narrow green leaves, either distinct from each other, or more or less grown together, and often with only the apex of each distinct, in the form of a tooth; the parts of the calyx are called *sepals*.

COROLLA: this is an inner whorl, usually much larger than the calyx, and variously colored—the showy part of the flower; the parts, called *petals*, are either distinct, or more or less grown together, often separate only at the apex, the lobes showing the number of petals. When the petals are *entirely* distinct the blossom is called *polypetalous* (many-petaled) (Fig. 10); when more or less united by their edges, *monopetalous* (one-petaled) (Fig. 11); if corolla and calyx are not both present, it is the corolla that is lacking, while the calyx is often colored like a corolla; the flower is then *apetalous* (without petals).

STAMENS (Fig. 12): consisting of *filament* and *anther*; the former usually slender and thread-like, enlarged at apex into the anther that contains the pollen; the filament is sometimes short and stout.

PISTIL (Fig. 13): consisting of *seed-case* (a) at base of flower, surmounted by an erect slender *style* (b) (much like filament of stamen), longer or shorter, and swollen at apex into a *stigma* (c), for receiving the pollen.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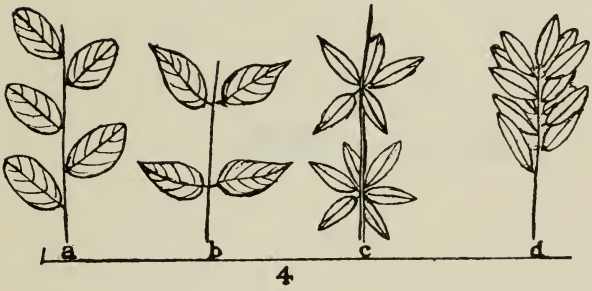
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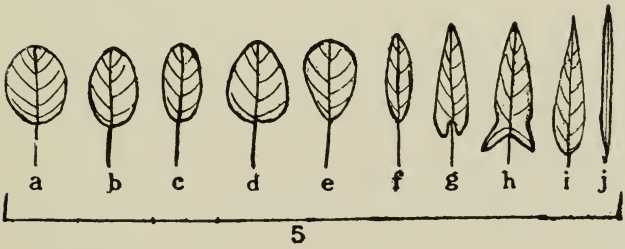
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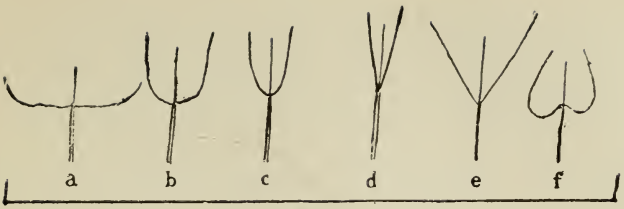

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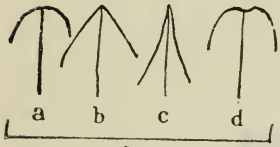

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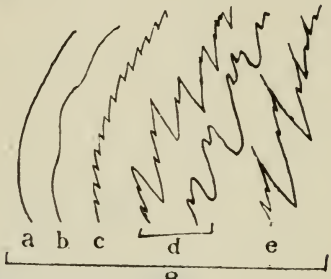

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A staminate flower has stamens, but no pistil; a pistillate flower has pistil, but no stamens; this form of growth prevails in the catkin-bearing (amentaceous) trees and shrubs; sometimes the two forms grow on the same plant; sometimes only the staminate on one, the pistillate on another, as in the ailanthus.

ARRANGEMENT OF BLOSSOMS

Blossoms grow either *singly* or *in clusters*. Clusters are of different forms:

An UMBEL contains few or several blossoms, whose separate stems grow from almost the same point on the branch, as in cherry or apple-tree (Fig. 14).

A RACEME is a slender, leafless, unbranched stalk, bearing numerous blossoms (with stems) throughout its length (Fig. 15).

A SPIKE is a raceme densely crowded with minute stemless blossoms (Fig. 16).

A PANICLE is a leafless branching stem covered with blossoms; in other words a *compound raceme:* both raceme and panicle commonly bear the rudiments of leaves, often called *bracts:* a leafy raceme has the leaves somewhat developed (Fig. 17).

A CORYMB is a raceme, in which the lower flower-stems are longer, producing a flat-topped or convex cluster (Fig. 18). Compound corymbs and cymes often have an immense number of blossoms, as in the hydrangea and hobble-bush.

A CYME is much like a corymb, flat-topped or convex, but the *middle* flowers developing first.

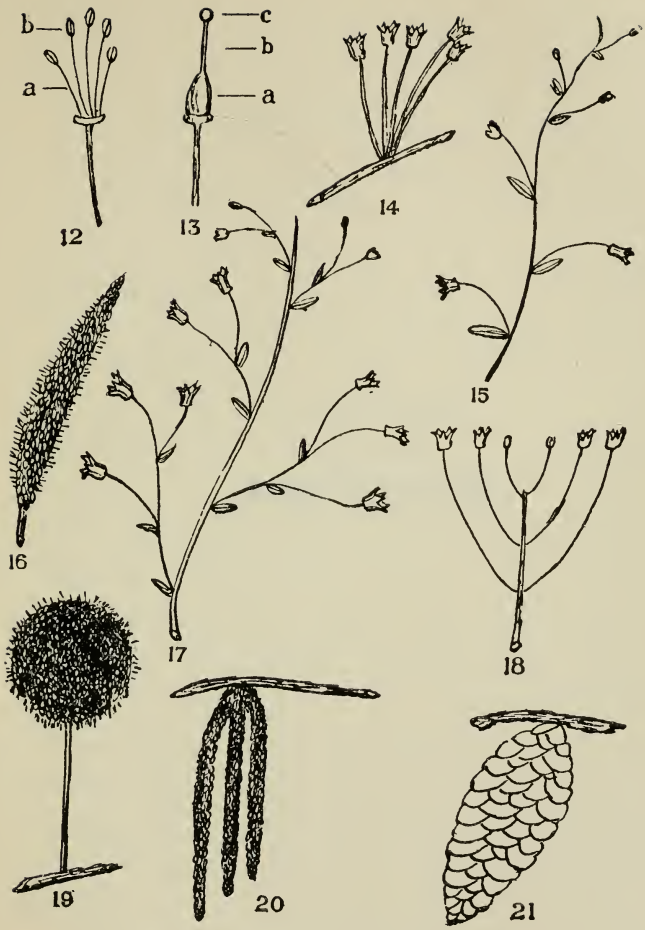
A HEAD is a dense spherical mass of small blossoms (Fig. 19).

A CATKIN or AMENT is much like a spike, but the blossoms are very rudimentary, having no corolla (sometimes no calyx), staminate and pistillate, and 1–4-clustered, each cluster under a scale or minute bract, and crowded on the stem (Fig. 20). Catkins are usually *pendent*, spikes *erect*.

A CONE is a longer or shorter (occasionally spherical) growth, covered with broad, flat, *rigid* scales *against* which (with no covering) lie the seeds (Fig. 21).

Blossoms (single or clustered) are *terminal* or *lateral*, according as they are borne at the end of the branch, or along the side.

These general facts of plant-structure, with the added glossary, suffice to explain all of the more technical terms used in the following descriptions. In the case of white-blossoming shrubs, it must be noted, *first of all*, whether the petals are distinct, or somewhat cohering by their edges (i.e., whether the flower is *polypetalous* or *monopetalous*), as the first two groups are based upon this difference : p. means polypetalous ; m. means monopetalous.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GLOSSARY

OF BOTANICAL TERMS USED IN THIS BOOK

Acuminate: tapering to a sharp point.
Alpine: on high mountains above the forest limit.
Amentaceous: like an ament or catkin, Fig. 20.
Anther: top of the stamen, containing the pollen, Fig. 12, b.
Apetalous: without petals.
Apex: top of leaf, petal or sepal.
Appressed: lying parallel with and close to stem.
Awl-shaped: pointed, and with broad base.

Beaked: surmounted by a slender, stem-like growth.
Bloom: white, powdery coating, which rubs off.
Bract: minute leaf, often at base of flower-stem, single or clustered.
Bristly: long-stiff-hairy.

Calyx: outer circle of green leaves in a blossom, Fig. 9.
Catkin: long, slender cluster of minute stemless flowers, Fig. 20.
Compound leaf: a leaf divided into several leaf-like parts, Figs. 2, 3.
Cordate: rather heart-shaped.
Corolla: inner circle of leaves in a blossom, Fig. 9.
Corymb: a flat- or round-topped flower-cluster, Fig. 18.
Crenate: with rounded teeth.
Crowded leaves: growing too closely to be distinctly alternate or opposite, Fig. 4, d.
Cyme: flattish-topped flower-cluster, the central ones developing first.

Deciduous: of foliage, falling in autumn.
Dissected: of leaves, cut into numerous deep lobes.

Double flowers: with additional petals, by transformation of stamens.

Elliptical: long-oval.
Emarginate: slightly notched at apex.
Entire: a leaf-edge unbroken by teeth or lobes, Fig. 8, a.
Even-pinnate: with an *even* number of leaflets.
Evergreen: retaining foliage over winter; distinctively applied to the type of foliage in cone-bearing plants.
Exserted: when stamens protrude above the top of the corolla-tube.

Fascicled: densely clustered, and radiating from one point, as leaves in the larch.
Filament: thread-like stem of anther, Fig. 12, a.

Habitat: area of natural growth.
Halberd-shaped: tapering, with abrupt lobes projecting at base, Fig. 5, h.
Head: a globular mass of flowers, Fig. 19.
Heart-shaped: referring especially to rounded indentation at base of leaf, Fig. 6, f.

Involucre: cluster of bracts at base of a flower-cluster.

Keeled: sharply ridged along the middle.

Leaflets: the leaf-like subdivisions of a compound leaf, Figs. 2, 3.
Lobed: leaf-edge deeply cut, Fig. 8, d.

Midrib: central vein in a leaf.
Monopetalous: with all the petals more or less united, Fig. 11.
Mucronate: abruptly tipped with a short point.

Obovate: reverse ovate, broad end at top.
Odd-pinnate: with an *odd* number of leaflets.
Opposite: with leaves on exactly opposite sides of stem, Fig. 4, b.
Oval: somewhat flattened circle.
Ovoid: applied to fruit when oval or ovate.

Palmate leaf: with all its leaflets radiating from same point, Fig. 3.

Panicle: a loose, lengthened compound flower-cluster, Fig. 17.
Papilionaceous: of butterfly-shape.
Perianth: calyx and corolla together, especially applied when they are colored alike.
Petal: leaf of corolla.
Pinnate leaf: with leaflets along a branch-like stem, Fig. 2.
Pistil: the seed-producing organ, Fig. 13.
Pistillate: said of a flower bearing a pistil without stamens.
Pith: "marrow" of a stem.
Polypetalous: with petals entirely distinct, Fig. 10.
Prickles: sharp-pointed outgrowth of *bark*.

Raceme: a lengthened, unbranched flower-cluster, Fig. 15.
Radical: growing directly from the ground, not from a branch.

Scabrous: rough-hairy.
Sepal: a leaf of the calyx.
Serrate: toothed edge of a leaf, Fig. 8, c.
Simple: said of a leaf when in one piece, Fig. 1.
Spike: a raceme of crowded, stemless flowers, Fig. 16.
Spine: a minute, sharp-pointed branch, outgrowth of the *wood*, not of the *bark*.
Stamen: pollen-producing organ, Fig. 12.
Staminate: said of a flower bearing stamens without pistil.
Stigma: summit of pistil, Fig. 13, c.
Stipules: minute, leaf-like bracts, sometimes (in pairs) at base of leaf-stem, and more or less coherent with it.
Style: support of stigma, Fig. 13, b.

Tendril: a thread-like growth in vines for supporting the plant.
Terminal: said of blossoms at *end*, rather than *along*, a branch.
Thorn: same as spine.
Trifoliate: compound leaf with *three* leaflets.
Twining: said of vines that *twist* around the support.

Umbel: flower-cluster whose stems radiate from one point, Fig. 14.

Variety: subdivision of a species.
Veins: composing the framework of a leaf; the larger ones are called ribs.

Wavy-edged: entire, yet slightly undulating, Fig. 8, b.

Wedge-shaped: lower part of leaf tapering with *straight edges* to a point.

Whorl: cluster of leaves encircling stem at same point, Fig. 4, c.

Winged: said of a seed with membranous extension, as in maple and elm.

BOTANICAL LIST OF ALL TREES, SHRUBS, AND VINES IN CENTRAL PARK

DECIDUOUS AND NON-CONIFEROUS TREES

Acer campestre
dasycarpum
negundo
palmatum
platanoides
polymorphum
polymorphum dissectum
pseudo-platanus
pseudo-platanus, var. atropurpureum
rubrum
saccharinum
saccharinum, var. dissectum
tartaricum
Æsculus hippocastanum
Ailanthus glandulosa
Alnus cordata
glutinosa
Amelanchier canadensis
Aralia spinosa

Betula alba, var. atropurpurea
alba, var. laciniata
alba, var. pendula
lenta
Betula lutea
papyracea
populifolia
rubra
Broussonettia papyrifera

Caragana arborescens
Carpinus americanus
betulus
Carya alba
porcina
sulcata
tomentosa
Castanea americana
sativa
Catalpa bignonioides
bungei
Celtis occidentalis
Cercidophyllum japonicum
Cercis canadensis
japonica
Citrus trifoliata
Cladrastis tinctoria
Colutea arborescens
Cornus alternifolia

DECIDUOUS AND NON-CONIFEROUS TREES—*Cont'd*

Cornus florida alba
florida rosea
Cratægus coccinea
crus-galli
flava
oxyacantha
oxyacantha flore plena rosea
tomentosa

Diospyros virginiana

Elæagnus angustifolia

Fagus ferruginea
sylvatica
sylvatica asplenifolia
sylvatica atropurpurea
sylvatica pendula
Fraxinus americana
excelsior
ornus
sambucifolia

Gleditschia sinensis
triacanthus
Gymnocladus canadensis

Halesia tetraptera
Hippophæ rhamnoides

Idesia polycarpa
Ilex aquifolium
aquifolium macrophyllum
opaca

Juglans cinerea
regia

Kœlreuteria paniculata

Laburnum vulgare
Liquidamber styraciflua
Liriodendron tulipifera

Maclura aurantica
Magnolia acuminata
conspicua
glauca
macrophylla
purpurea
soulangeana
tripetala
Morus alba
nigra
rubra

Nyssa multiflora

Ostrya virginiana
Oxydendron arboreum

Paulownia imperialis
Pavia flava
ohioensis
rubra
Phellodendron amurense
Platanus occidentalis
orientalis
Populus alba
balsamifera
dilatata
monilifera
tremuloides
Prunus cerasus
mahaleb
padus
pennsylvanicus

DECIDUOUS AND NON-CONIFEROUS TREES—*Cont'd*

Prunus pissardii
serotina
spinosa
Ptelea trifoliata
Pyrus aria
floribunda
malus
spectabilis
toringo

Quercus alba
bicolor
cerris
coccinea
imbricaria
lyrata
macrocarpa
nigra
obtusiloba
palustris
phellos
prinus
robur
robur asplenifolia
robur pendula
rubra

Rhamnus catharticus
Robinia pseudacacia
pseudacacia, var. inermis

Salisburia adiantifolia
Salix alba vitellina
babylonica
discolor
lancifolia
pentandra
rosmarinifolia
Sassafras officinale
Sophora japonica

Tilia americana
europæa

Ulmus americana
campestris
effusa
fulva
montana
parvifolia

Viburnum lentago
prunifolium

EVERGREEN AND CONIFEROUS TREES

Abies balsamea
concolor
excelsa
fraseri
nordmanniana
orientalis
pungens

Cedrus atlantica
libani
Cephalotaxus fortunei
Cryptomeria japonica
Cupressus thujoides

Juniperus communis

EVERGREEN AND CONIFEROUS TREES—*Continued*

Juniperus prostrata
sabina
squamata
virginiana

Larix americana
europæa

Pinus austriacus
cembra
excelsa
inops
mitis
mugho
rigida
strobus
sylvestris
tæda
Pseudo-Larix kæmpheri

Retinospora ericoides
obtusa
obtusa aurea
pisifera

Taxodium distichum
Taxus baccata
cuspidata
Thuja gigantea
occidentalis
Tsuga canadensis
Douglasii

SHRUBS

Æsculus macrostachya
Alnus viridis
Amorpha fruticosa
Amygdalus communis flore pleno
Andromeda floribunda
Aralia chinensis
pentaphylla
Aucuba japonica
Azalia amœna
calendulacea
mollis
nudiflora
pontica
viscosa

Baccharis halimifolia
Berberis Fortunei
Berberis Thunbergii
vulgaris
vulgaris purpurea
Buxus sempervirens

Calluna vulgaris
Calycanthus floridus
lævigatus
Caragana arborescens
Cephalanthus occidentalis
Chionanthus virginica
Clethra alnifolia
Colutea arborescens
Cornus mas
sanguinea
sericea
stolonifera
stricta

Botanical List of Trees, Shrubs and Vines

SHRUBS—*Continued*

Corylus avellana
avellana atropurpurea
Cotoneaster frigida
vulgaris
Cratægus pyracantha
Cydonia japonica
vulgaris

Deutzia crenata
gracilis
scabra

Elæagnus argentea
longipes
Erica carnea
Euonymus americana
japonica
Exochorda grandiflora

Fontanesia Fortunei
Forsythia Fortunei
suspensa
viridissima

Hamamelis virginica
Hibiscus californicus
syriacus
Hydrangea arborescens
hortensis
nivea
paniculata grandiflora
quercifolia
Hypericum moseriana

Ilex verticellata

Jasminum nudiflorum

Kalmia latifolia
Kerria japonica
japonica flore pleno
japonica fol. var.

Leucothoë catesbæi
Ligustrum ibota
italicum
ovalifolium
vulgare
Lindera benzoin
Lonicera fragrantissima
morrowi
rubra
tartarica
Lycium barbarum
chinense

Magnolia stellata
Mahonia aquifolia
Myrica cerifera

Philadelphus coronarius
gordonianus
grandiflorus
inodorus
nana aurea
Prunus maritima
sinensis
virginiana
Pyrus arbutifolia erythrocarpa
arbutifolia melanocarpa

Rhamnus alaternus
frangula

SHRUBS—*Continued*

Rhododendron hybridum
ponticum
Rhodotypus kerrinoides
Rhus copallina
cotinus
glabra
glabra laciniata
typhina
Ribes aureum
Robinia hispida
Rosa blanda
Boursaltii
canina
centifolia
rubiginosa
rugosa
Rubus fruticosa
fruticosa laciniata
idæus
odoratus

Sambucus canadensis
nigra
nigra aurea
racemosa
Shepherdia argentea
Spiræa Antonia Wateri
callosa alba
callosa rosea
Douglasii
Fortunei
opulifolia
opulifolia aurea
prunifolia
Reevesii
Reevesii flore pleno
Spiræa salicifolia
sorbifolia
Thunbergii
tomentosa
trilobata
Van Houttii
Staphylea colchica
pinnata
trifoliata
Stuartia pentagyna
Styrax japonica
Symphoricarpus racemosa
vulgaris
Syringa Josikæa
persica alba
persica rubra
villosa
vulgaris alba
vulgaris rubra

Tamarix africana
gallica
indica

Vaccinium corymbosum
frondosum
vacillans
Viburnum acerifolium
cassinoides
dentatum
lantana
lantanoides
opulus
oxycoccus
plicatum
tomentosum

Botanical List of Trees, Shrubs and Vines

SHRUBS—*Continued*

Weigela Abel Carriere
amabilis
candida
Desboissii
Eva Rathka
Lavallei
Weigela rosea
rosea fol. var.

Xanthoceras sorbifolia
Xanthorhiza apiifolia

VINES

Akebia quinata
Ampelopsis quinquefolia
tricolor
Veitchii
Aristolochia sipho

Celastrus scandens
Clematis coccinea
flammula
Ilenryi
Jacqmannii
lanuginosa
paniculata

Euonymus radicans
radicans fol. var.

Hedera hibernica

Juniperus squamata

Lathyrus latifolia
Lonicera brachypoda
halleana
Lonicera japonica
sempervirens

Periploca græca

Rhus toxicodendron
Rosa arvensis
Baltimore Belle
crimson rambler
setigera
wichuriana
yellow rambler

Schizophragma hydrangeoides
Smilax rotundifolia

Tecoma grandiflora
radicans

Vinca minor
Vitis æstivalis
labrusca
vinifera

Wistaria fruticosa
sinensis

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